

COMMUNITY PLANNING ASSOCIATION OF CANADA

COMMUNITY PLANNING REVIEW

HOUSING DESIGN SUPPLEMENT ONE



This is the first part of a study for Canadians of the composition of groups of dwellings. While the Association retains its concern with other sides of the housing question, it would show in issuing this publication its major concern: with the *kinds* of communities being built, not merely the number and cost of new dwellings. These pages deal with the categories of residential buildings now going up, and more especially with their optimum relation to the spaces and services about them, when they are arranged in varying blends and groups. The production is by staff of Central Mortgage and Housing Corporation, advised by a committee including representatives of this Association, and of the Royal Architectural Institute of Canada; the latter also offers this information to its members in September 1952.

REVUE CANADIENNE D'URBANISME

L'ASSOCIATION CANADIENNE D'URBANISME

H O U S I N G D E S I G N

There are about $3\frac{1}{2}$ million houses in Canada, about half a million of which have been built since World War II. Canadians continue to multiply and new residential areas must be provided for the growing population and its changing disposition in old cities and on new frontiers. The creation of these housing developments will continue to offer an extraordinary test of our skills in organization, design and construction.

Housebuilding is no longer a simple task of constructing individual houses for particular owners. It is now a large-scale operation for producing each community's stock of housing; it requires the collaboration of many parties including, amongst others, land-subdividers, financial institutions, building organizations and various government authorities. The house designer and even the ultimate occupants of housing have come to play but a minor role in its creation; the removal of this personal factor has brought about the stereotyped character of much post-war housing. We therefore seek to restore a more humanistic approach, to enlist the talents of the imaginative designer of domestic architecture, who may project the housing requirements of the younger generation and interpret the needs of older people.

This presentation of the subject of Housing Design is based largely on contemporary Canadian examples, together with comparable examples from Britain and the United States. It is an attempt to bring some system into the treatment of the subject, requiring a process of classification, analysis and oversimplification. This is not intended to suggest that housing design can be cast into any rigid formulas, but rather to sketch in the broad, comprehensive background against which the designer must work. If there is a theme which runs through this presentation, it is the theme of diversity and variety of accommodation required to reflect the diversity and variety of society itself.

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This publication was prepared by staff of the Central Mortgage and Housing Corporation assisted by a committee which included representatives of the Royal Architectural Institute of Canada and of the Community Planning Association of Canada.

First there are illustrated some examples of large-scale housing projects in which principles of community planning have been observed. These examples demonstrate

- (1) The separation of main traffic streams from residential streets
- (2) The provision of schools, shops and recreation space within the project
- (3) The introduction of diversified forms of housing accommodation

Supported by provincial legislation for community planning a considerable number of Canadian municipalities are now in the process of planning their future residential development. Many of these plans are based on the conception of the neighbourhood as a self-contained community unit. This provides a framework within which a housing project may form either the whole or a part of a neighbourhood. A municipality is entitled to set out the general scheme of neighbourhood design by virtue of its powers: To plan the street system

- To acquire public open space
- To locate public buildings
- To provide municipal services
- To control the uses of land

Opportunities for planning residential areas by more direct action have now been provided by Section 35 of the National Housing Act through which the Federal and Provincial governments may jointly acquire and develop land for residential use.

The examples illustrated here are projects of neighbourhood design carried out by single developers, either public or private. To impose a scheme of neighbourhood design upon a number of independent landowners and housebuilders is obviously a more difficult task. This is, however, the normal condition and we cannot depend upon the rare opportunities for large-scale single-ownership development. For this reason the progress of housing design depends very much upon the capacity of municipal planning staffs to use in an understanding way the powers and techniques that are at their disposal under provincial legislation. Particularly must the powers of land-use control, through zoning bylaws, be applied so as to bring about an organic arrangement of the component parts of a neighbourhood; land must be set aside for shopping centres and open spaces, provision must be made for the various types of housing that are required within a well-balanced neighbourhood community. Zoning which segregates each type of housing into large uniform districts may actually defeat the aims of neighbourhood planning and good housing design.

At the present time the strongest influence upon the design of housing projects is the plan of Radburn, New Jersey (designed by architects Clarence Stein and Henry Wright in 1928). This familiar plan is therefore illustrated here as a classic example demonstrating the concept of a whole neighbourhood, based upon a street system separating vehicular from pedestrian traffic and introducing the arrangement of housing groups. There are no Canadian examples which completely fulfil the principles so well demonstrated here; but Radburn still stands as a source from which Canadian planners have derived many of their ideas.

RADBURN

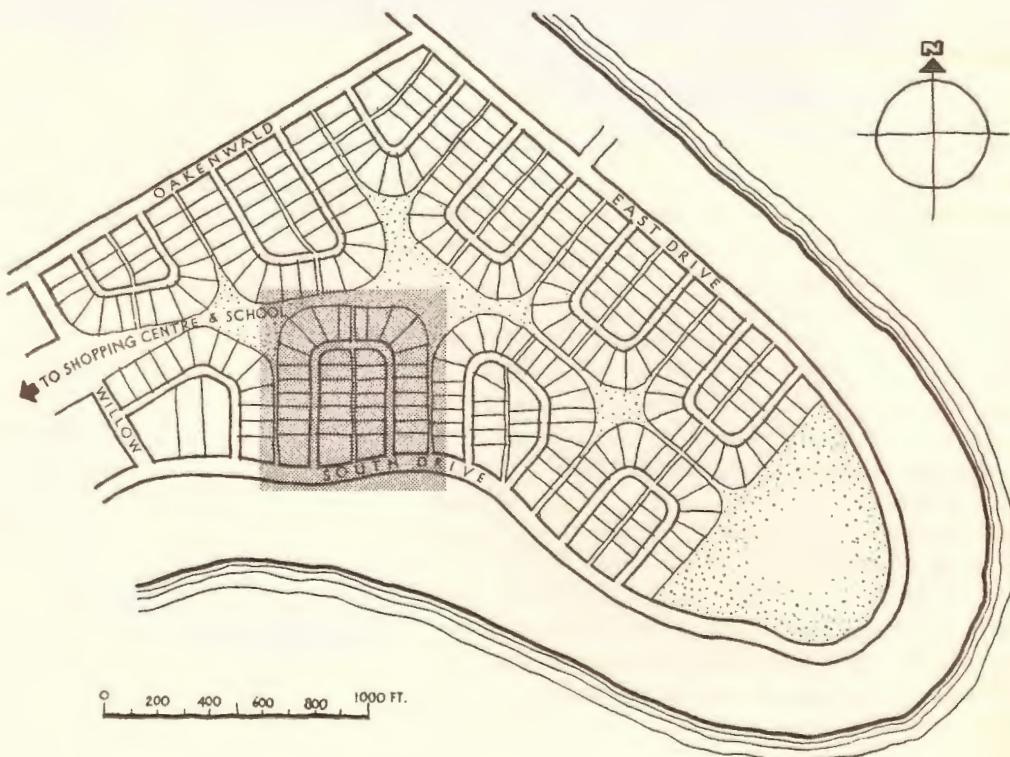
Separation of Pedestrians



Radburn is the North American prototype demonstrating the superblock with interior park system and exterior traffic streets. Houses are grouped around a series of service streets, the houses being fronted towards the interior park and its circulating footpaths which give direct pedestrian access to school and shops. The project was begun in 1929 and economic depression prevented its completion. The portion that was built has, however, been sufficient to validate the planning principles advocated by its designers, Clarence Stein and Henry Wright. These principles are now reflected in a number of Canadian sub-divisions.

WILDWOOD

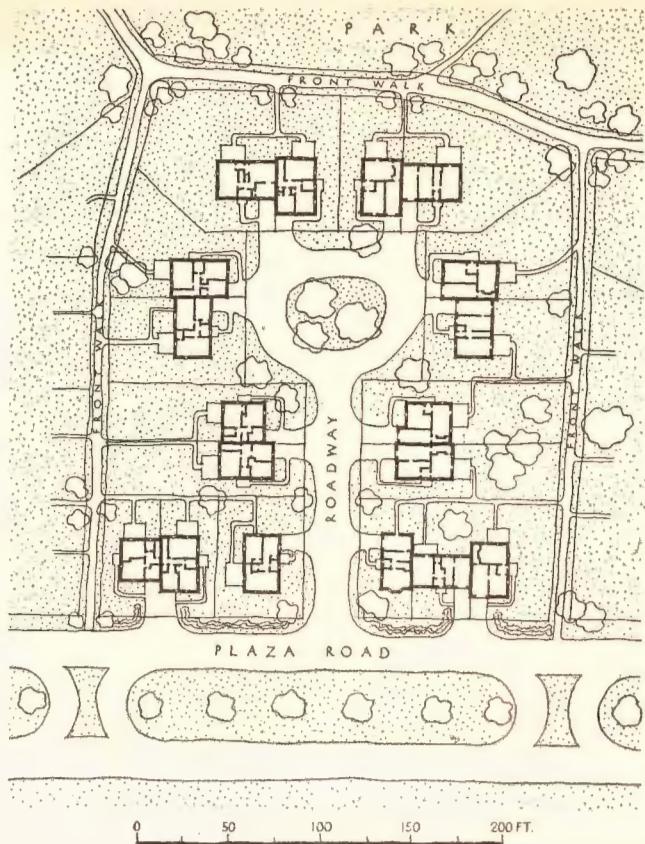
Wildwood, planned and constructed by a private developer beginning in 1946, is a variation on the Radburn principles.



and Vehicles

RADBURN, N.J.

A typical dead-end street showing vehicular access to houses and separation of pedestrian routes. Garages are built into semi-detached houses, kitchens adjoin service access, living-rooms face gardens and park areas. (Ground floor plans are shown on right side of plan, bedroom floor plans on left side). The Radburn type of site-plan requires individual house plans designed to fit these special conditions.

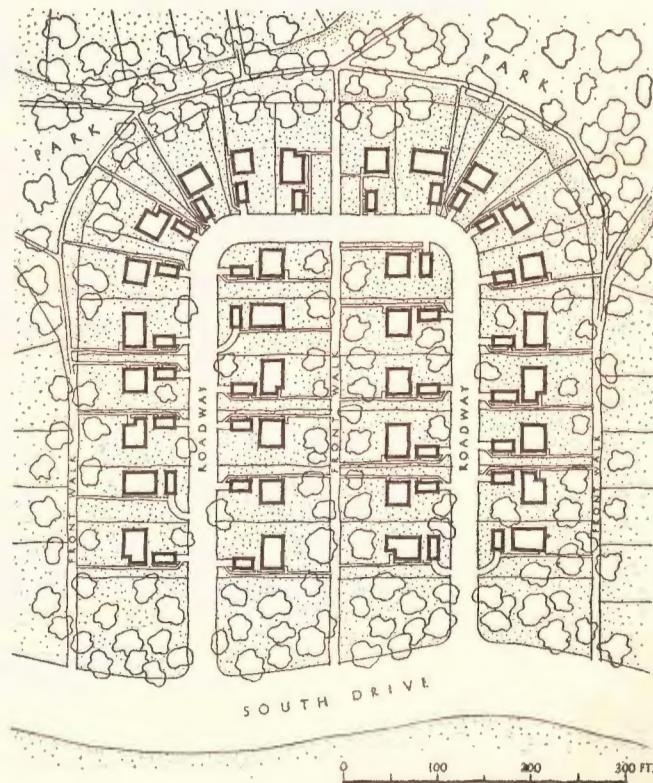


WILDWOOD, Winnipeg, Man.

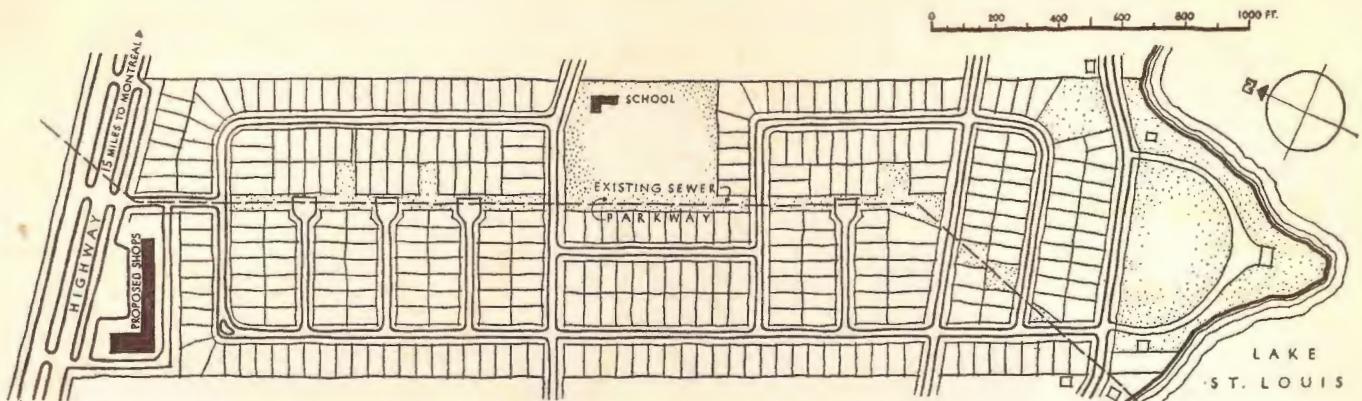
The Radburn dead-end streets have been replaced by loops, largely because they are more convenient for snow clearance, fire protection, etc. Garages are on these service streets and houses face into the interior park which is used as a play area and route to the local shopping centre.

A typical loop street showing that a less intimate connection between houses and interior park is achieved by this form of plan, particularly for houses inside the loop. With garages as separate buildings there is also a less orderly arrangement of the service street. A variety of house types has been used to give informality to the project whereas the Radburn plan has a consistent and more compact arrangement of houses.

The site is a partially wooded area of 87 acres contained by a bend of the Red River. Footpaths are provided through the interior wooded park and vehicular traffic moves on the encircling exterior street which has no sidewalks.

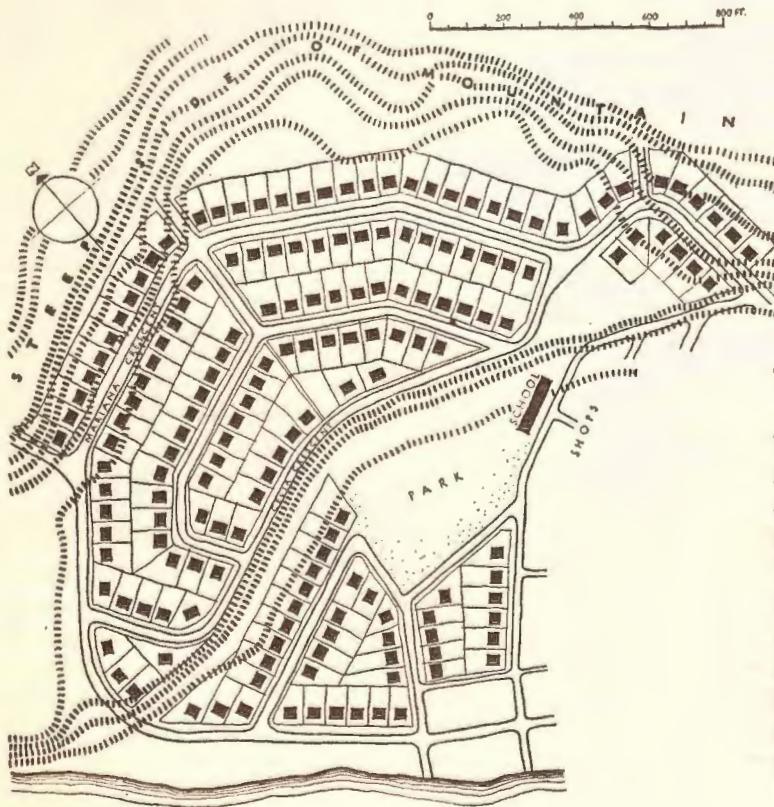


Site Limitations



BELAIR, Dorval, Que.

Belair is a residential subdivision which illustrates the limitations imposed by boundaries of property ownership. Farm lands in the Province of Quebec are normally held in long strips which are not easily converted to urban use on a Neighbourhood Plan. In this case the plan was also influenced by the location of a main sewer line from Dorval Airport; this line has been used as a path through the subdivision directly connecting the river-front with the school, playground and shopping centre. This path also provides access to dead-end streets for fire trucks and snow ploughs.

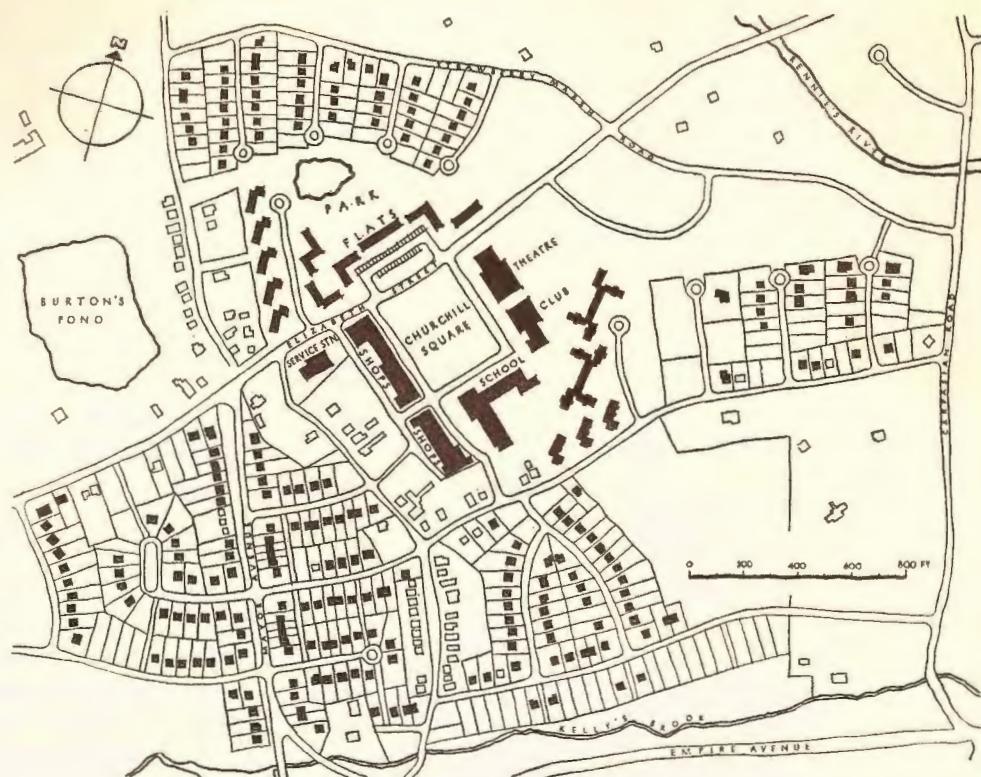


TRAIL, B.C.

Trail Rental Project for veterans was planned and constructed for CMHC in 1948, and demonstrates how an interesting plan can emerge from difficult topographical conditions. The site is a semi-circular terrace of land contained and dominated by steep mountain slopes with one side open to the Columbia River. The site for 175 houses is divided into two levels and the whole project is carefully fitted to the contours of the ground. (Douglas C. Simpson, Architect and Site Planner).

Diversity of Housing Types

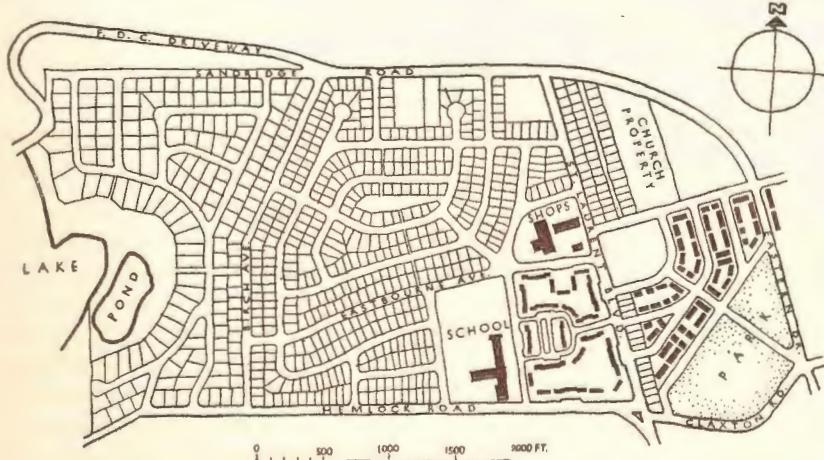
**CHURCHILL PARK
VILLAGE,
St. John's, Nfld.**



Churchill Park Village is a residential development on land assembled and planned in 1947 by the City Housing Corporation, a public agency established to develop a new residential area for the City. The plan provides for single houses, row houses and apartments closely integrated with one another and focused upon a central

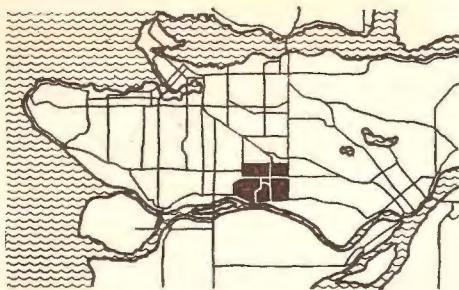
open square which provides a setting for stores and community buildings. The northern and eastern sections of the Neighbourhood are designed as superblocks with direct interior access to the central square (Searles and Meschino, Planning Consultants and Architects).

MANOR PARK, Ottawa.



Manor Park is a residential development begun in 1946 which contains three types of housing accommodation. The planning and construction of the main area were carried out by private developers, with NHA loans on about 450 bungalows, 1½-storey and 2-storey houses. To this have been added a row housing group of 204 units and a group of 500 apartments. All are conveniently related with the central school site and shopping centre. The Neighbourhood is protected on the south by Federal District Commission parklands and on the west by the larger private properties of Rockcliffe Park Village.

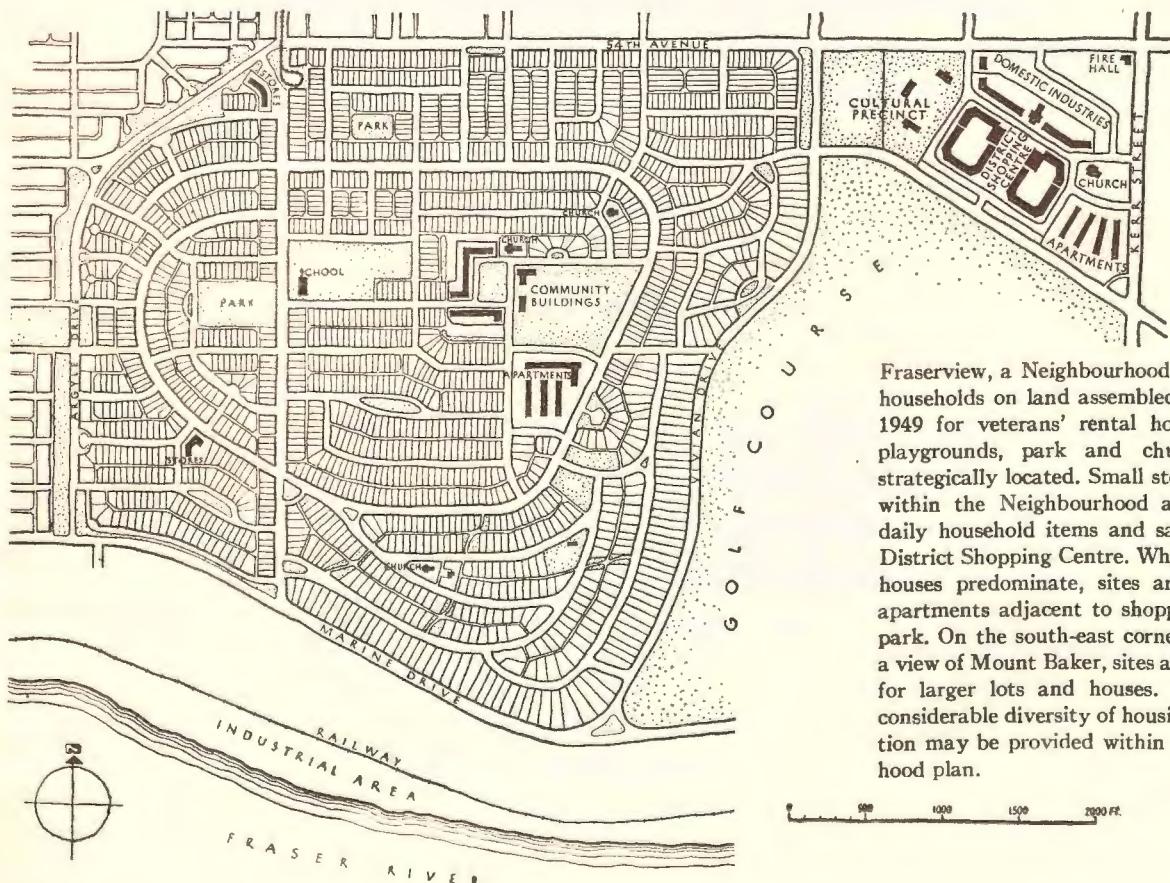
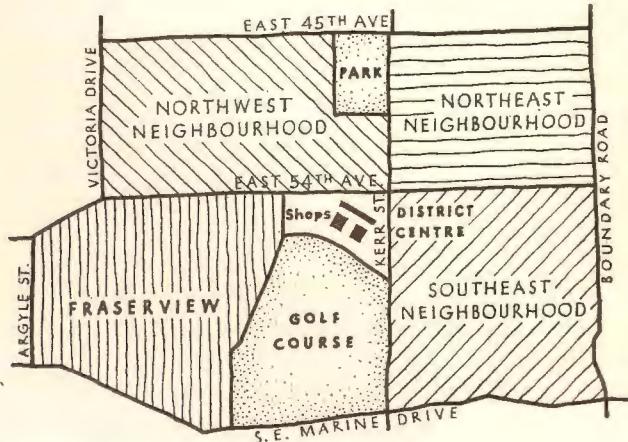
Housing Project within Community Plan



City of Vancouver showing location of residential District of which Fraserview forms one Neighbourhood.

FRASERVIEW, Vancouver, B.C.

Residential District composed of four Neighbourhoods each bounded by traffic routes connected with main arterial system of the City. Principal shopping and commercial area is at centre of District, equally accessible from four Neighbourhoods. Local service industries such as laundries and bakeries are also located at centre of District. Heavy industries served by railway are to south of District on the Fraser River. Golf course provides large open space between Fraserview and south-east Neighbourhood.



Fraserview, a Neighbourhood for about 1500 households on land assembled by CMHC in 1949 for veterans' rental housing. Schools, playgrounds, park and church sites are strategically located. Small stores are located within the Neighbourhood area to provide daily household items and save journeys to District Shopping Centre. While single-family houses predominate, sites are provided for apartments adjacent to shopping centre and park. On the south-east corner, commanding a view of Mount Baker, sites are also provided for larger lots and houses. In this way a considerable diversity of housing accommodation may be provided within the Neighbourhood plan.

Along the streets of our cities and towns are to be seen many different forms of houses, traditional and characteristic of the periods in which they were built. Their size, their shape, their materials and their craftsmanship reflect the changing circumstances of our society and our economy. As part of this scene the half-million houses built in the present post-war period have a certain generic resemblance to one another because they were built within the same economic limitations and inspired by the same social attitudes. Their materials and craftsmanship are the product of our industries, their design arises out of our history and habits. For better or worse they represent our present achievement in providing housing for family living.

Whatever may be thought of their architectural character, the plans of these houses have a certain validity because they have been evolved out of the stern and practical process of trial and error. They work reasonably well and they provide the kind of accommodation required, within an economical perimeter of walls and roof. They are built to accommodate the furniture and mechanical equipment that are available and they are based on familiar ways of living. It is likely that changes and improvements will occur through an evolutionary process of refinement rather than through radical innovations. During the recent period the most noticeable improvements have come from a clearer separation of the sleeping, living and working areas of the house and from efforts to provide better lit and better proportioned rooms.

Architects to-day are stimulated by the new forms of design arising out of the industrial age. A fresh approach to domestic architecture has been suggested by the expressions "open planning" and "the house is a machine for living in". Progressive designers are consequently inclined to scorn the current crop of small houses relatively untouched by the new spirit, losing sight of the fact that the composite design of housing groups presents a new opportunity for imaginative domestic architecture. In approaching this task the designer must accept the basic forms which have been evolved by the practical experience of builders, for these are the tradition in which we work. Acceptance of a tradition, in this wide sense, does not restrict a designer from doing distinguished and original work; the finest works of domestic architecture have always been confirmations of, rather than exceptions from the tradition. A knowledge of the basic forms and limitations is therefore an essential part of the designer's equipment.

SOME BASIC TYPES OF SMALL HOUSE PLANS

a classification based on the relationship between living room and bedrooms

LIVING ROOMS FACING FRONT	LIVING ROOMS FACING REAR	LIVING ROOMS BOTH ASPECTS
BUNGALOWS — 2 BEDROOMS		
BUNGALOWS — 3 BEDROOMS		
1 1/2 STOREYS — 3 BEDROOMS		
1 1/2 STOREYS — 4 BEDROOMS		

Street frontage is on the lower side of each plan. Plans in each horizontal row are of similar pattern, but each requires different disposition of front entrance, kitchen and service entrance.

The component elements in the plan of a small house may be arranged in an infinite variety of ways. There is, however, considerable uniformity in the accommodation provided in the houses currently built in Canada and consequently it is found that the majority of house plans are variations upon a comparatively few prototypes. The principal differences of accommodation are in the choice of two or three bedrooms and in the provision of a separate or attached garage. The basementless house with its need for equivalent storage and utility space is not yet an accepted feature of Canadian housing. The dining-room, as a separate room, has been almost completely abandoned.

In the simplest analysis a house consists of two parts. There is the living area in conjunction with which are the kitchen and dining space. There is the bedroom area with which is associated the bathroom. Each of these two main parts is also provided with its appropriate storage arrangements. There tends to be considerable uniformity in the amount of space provided for each function because builders work within the same maximum and minimum limitations. The minimum standards are established in local by-laws and the regulations of lending institutions. The maximum limits upon the floor-space are governed by building costs and purchasing power.

The relationship between the living and bedroom areas provides a useful basis of classification by which the prototypes may be recognized. The bedrooms may be on the floor above the living area or on the same level (or on a half level). If they are on the same level, in bungalow fashion, the bedrooms may be on the front or the rear or the side of the living area. The diagrams on the opposite page show the principal varieties of such arrangements. The value of this systematic classification is that it reveals to the designer the whole range of prototypes from which he may select a type of plan suitable for a particular site and circumstances. An examination of house plans used in Canada and the United States shows that satisfactory plans have been derived from every prototype, with a marked preference for certain types. It is not possible to evaluate the merits of any one of these plan arrangements without reference to the location and orientation in which it is to be used. The skill of the designer lies in selecting a suitable type of plan and developing from it an interesting and workable detailed arrangement.

A primary consideration in the design of a house is the aspect and orientation of the living room. It is a long-established convention that the living room should be at the front of the house and the kitchen and working area at the back. This is based on the assumption that the street offers the most interesting scene and that the living room windows provide the principal architectural expression of the house. The soundness of this convention is now being questioned, particularly under the influence of the Radburn type of site-plan. It is suggested that the street should be regarded as a service route for vehicles and that the living area of the house should face upon the quieter open space at the rear. It may also be argued that the disposition of the living room should be governed by orientation to sunlight. For this purpose the "through" type of living room offers a compromise; or direct sunlight may be brought into the living room through the dining space.

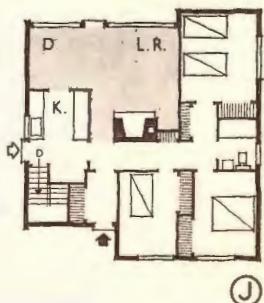
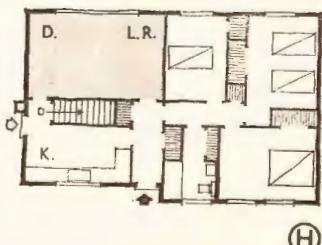
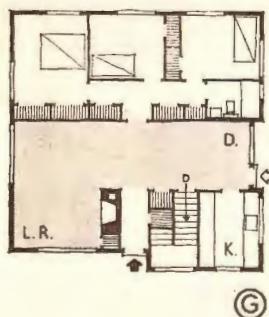
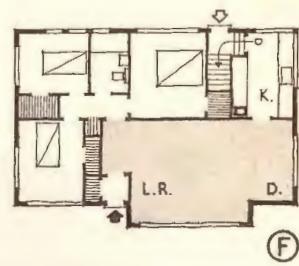
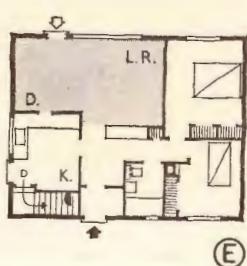
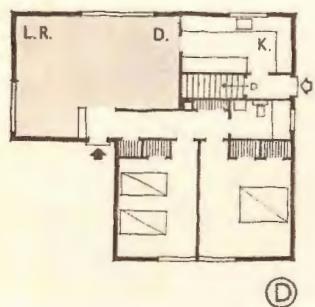
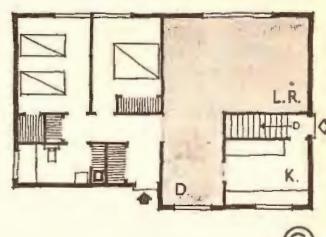
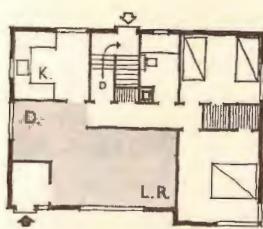
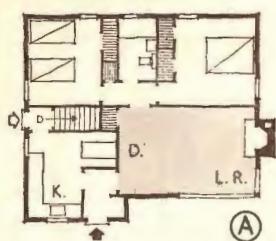
On the following two pages are illustrated some representative plans derived from the prototypes; they are drawn from designs prepared for the Central Mortgage and Housing Corporation. They conform with the minimum standards of local by-laws and the National Housing Act regulations. With various relationships of living and bedroom areas they all provide satisfactory separation of these functional areas and solve the problems of internal circulation without waste of floor space.



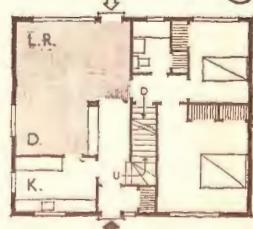
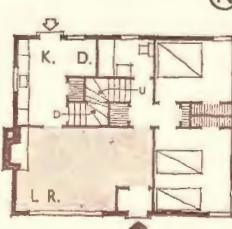
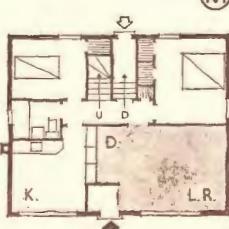
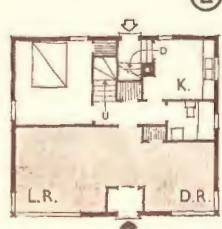
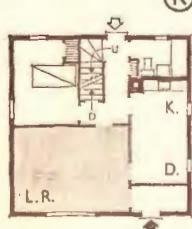
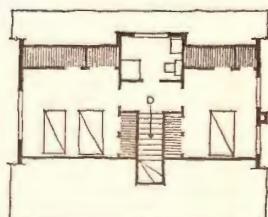
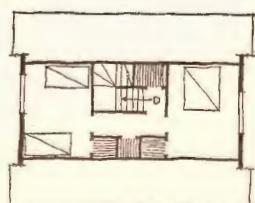
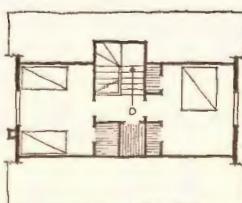
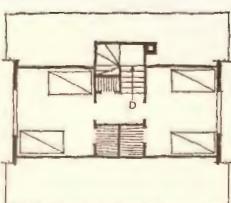
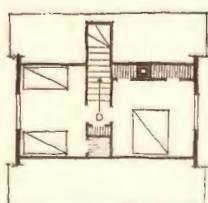
The plans on pages 12 and 13 are attributed to the following sources: (A, F, L, M, N) M. G. Dixon; (B) Smith, Munn, Carter and Katelnikoff; (C & D) Edwin Raines; (E) Erwin Bamberger—Delineator, J. Bird; (G) Roy Sellors; (H, R, T) Wilson & Newton; (J) G. Burniston and J. Storey; (O) Henry Fliess; (S) Michael Bach; (K, P, Q, U, V, W, X) Central Mortgage & Housing Corporation. The majority of these plans are reproduced from Central Mortgage & Housing Corporation's three booklets entitled "Small House Designs" — Bungalows, Storey-and-a-Half and 2-Storey.

P L A N S O F B A S I C S P A C E A R R A N G E M E N T

Bungalows



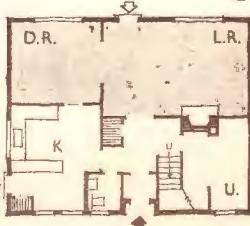
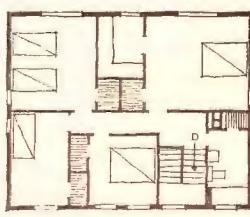
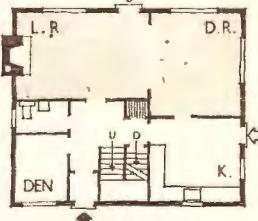
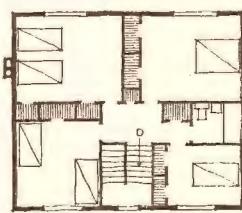
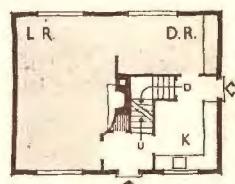
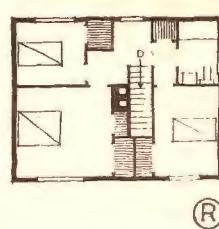
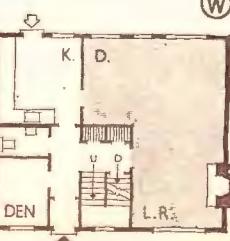
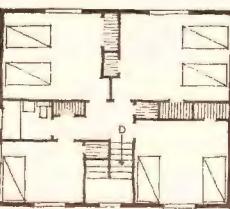
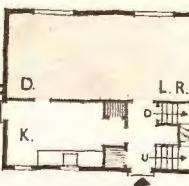
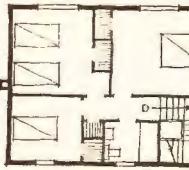
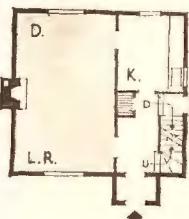
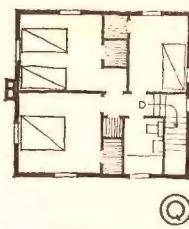
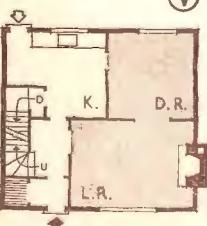
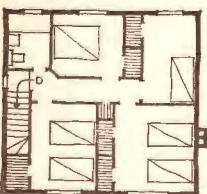
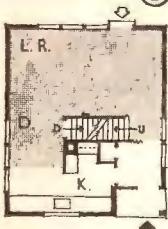
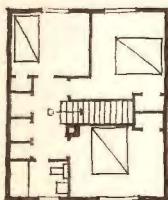
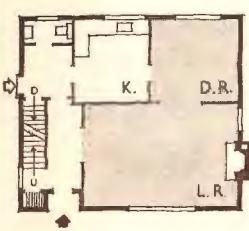
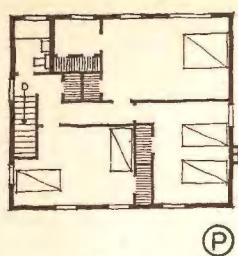
1½-Storey



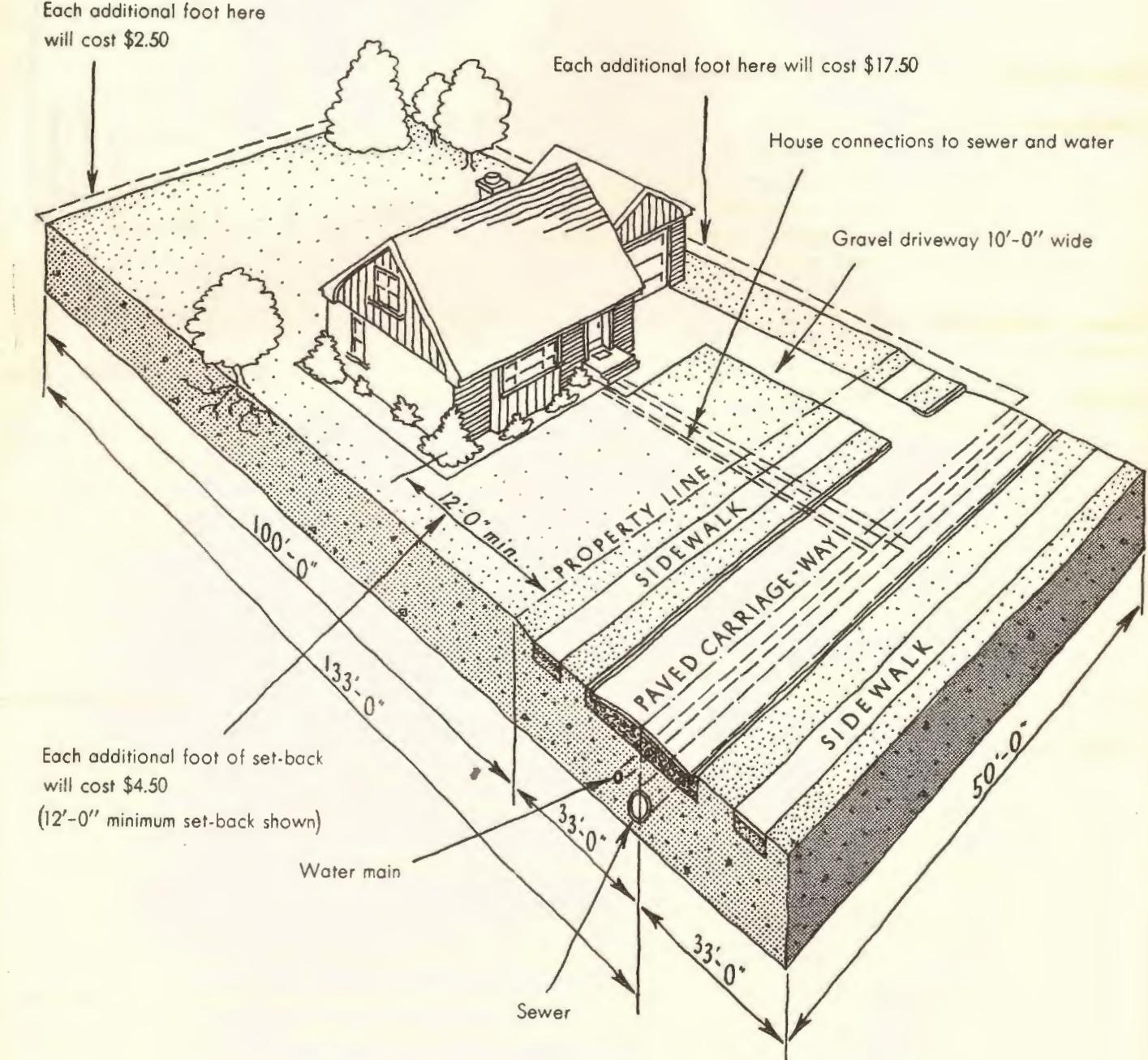
FOR SINGLE FAMILY DWELLINGS

All the plans shown on this page readily lend themselves to adaptation as semi-detached house plans.

Two-Storey and Semi-Detached



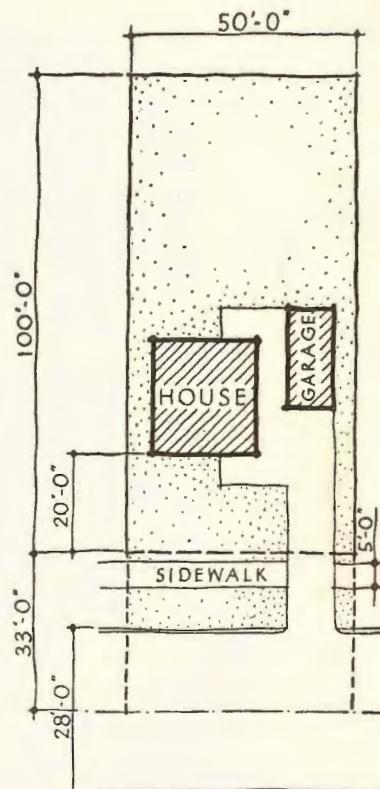
COST ANALYSIS OF LOT IN RELATIONSHIP TO HOUSE AND SERVICES



SUMMARY OF COSTS FOR A SINGLE-FAMILY DETACHED HOUSE

The following figures are based on a lot 50' x 100' as shown in the sketch. The prices used in the calculation on this page will not apply to all parts of Canada, but may be taken as a relative guide.

		Cost	% of Total
Undeveloped Land	Say \$1200 per acre	\$250	2.36
Preliminary Expenses	Legal Fees	\$125	
	Survey Fees	75}	1.89
	Architectural Fees (these will vary according to the service desired and have consequently been omitted)		
House Construction (Including Garage)	Materials	\$5400	
	Labour	3600}	85.0
Services	Sidewalk	\$67.50	
	Street paving & curb	245.00	
	Main sewer, with manholes and catchbasins	148.00	
	Watermain & hydrants	94.50}	6.87
	Connection of house to sewer	92.50	
	Connection of house to watermain	89.50}	
	Electricity & telephone not included		
Landscaping	Driveway (Gravel)	\$60.00	
	Paths	40.00}	3.88
	Garden	300.00	
		Total \$10,587.00	100%

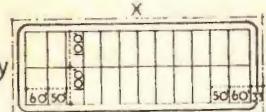
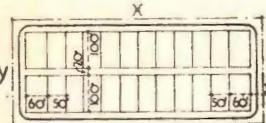
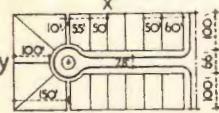
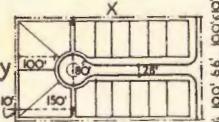
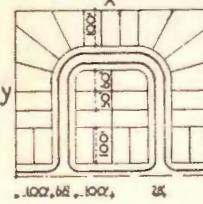
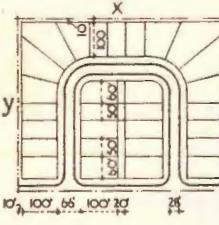
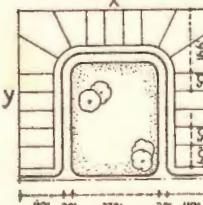
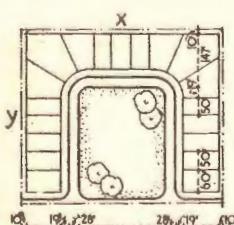


Effect of Larger Lots on Cost

- Each foot added to length of lot will cost \$2.50 (Cost of land only).
- Each foot increase in set-back of house from road will cost \$4.50 (increased length of drains, water pipe and driveway).
- Each foot added to width of lot will cost \$17.50 (Cost of land, increased length of sewer, water main, sidewalk and street paving).

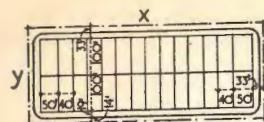
EFFECT OF VARIOUS PATTERNS OF LAYOUT ON

The Single-Family House

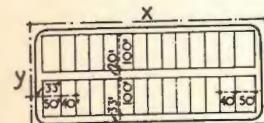
		Number of lots	Dimensions (in feet) x y		Densities net gross	Linear feet per house of: Road Lane	Sewer Main	Water Main
	GRID without lanes	short grid	24	686	266	8.4	5.7	36.9
		long grid	44	1216	266	8.4	5.9	32.2
	GRID with lanes	short grid	24	686	286	8.4	5.3	37.8
		long grid	44	1216	286	8.4	5.6	32.6
	CUL-DE-SAC without lanes	short cul-de-sac	16	503	266	7.1	5.2	37.0
		long cul-de-sac	30	853	266	7.8	5.8	31.4
	CUL-DE-SAC with lanes	short cul-de-sac	16	513	286	7.1	4.8	37.6
		long cul-de-sac	30	863	286	7.8	5.3	31.7
	LOOP without lanes	short loop	29	532	459	7.3	5.2	38.0
		long loop	57	532	809	7.9	5.8	31.6
	LOOP with lanes	short loop	29	572	479	7.0	4.6	40.0
		long loop	57	572	829	7.8	5.2	32.7
	LOOP WITH CENTRE GREEN without lanes	short loop	19	532	459	6.5	3.3	59.0
		long loop	33	532	809	7.1	3.3	55.2
	LOOP WITH CENTRE GREEN with lanes	short loop	19	572	479	6.5	3.1	59.5
		long loop	33	572	829	7.1	3.1	55.5

DENSITIES & LENGTHS OF STREETS, SERVICES, ETC.

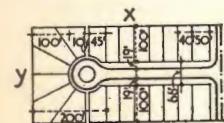
The Semi-Detached House



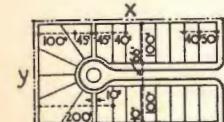
GRID
without
lanes



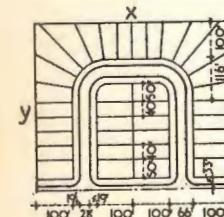
GRID
with
lanes



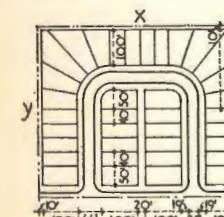
CUL-DE-SAC
without
lanes



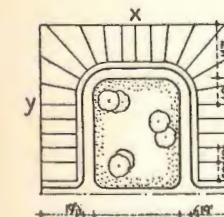
CUL-DE-SAC
with
lanes



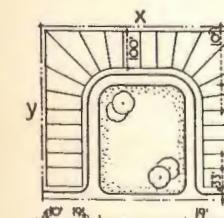
LOOP
without
lanes



LOOP
with
lanes

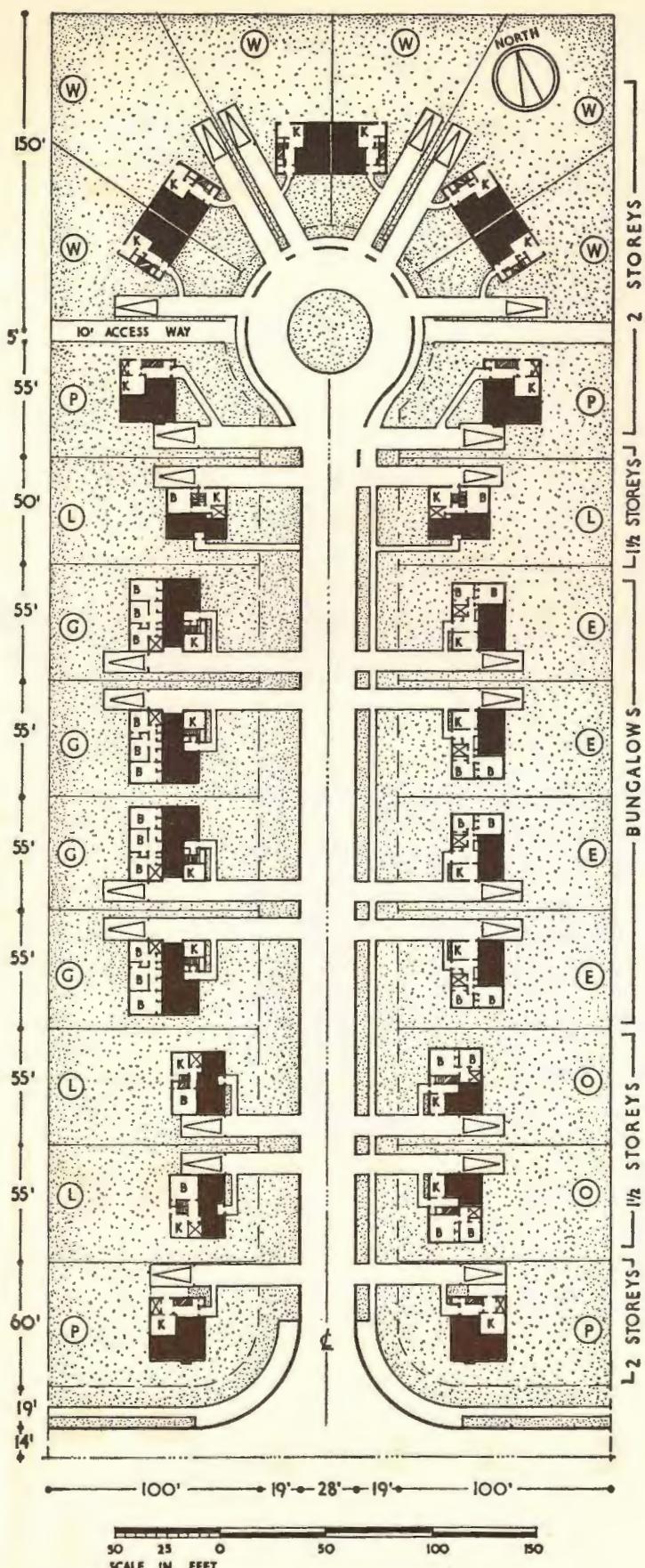


LOOP WITH
CENTRE
GREEN
without lanes



LOOP WITH
CENTRE
GREEN
with lanes

		Number of lots	Dimensions (in feet) x y	Densities net gross	Linear feet per house of: Road Lane Sewer Main Water Main
GRID without lanes	short grid	28	646 266	10.5 7.1 30.2	32.6 32.6
	long grid	56	1236 266	10.5 7.4 25.6	26.8 26.8
GRID with lanes	short grid	28	646 286	10.5 6.6 30.9 22.1 33.3	33.3
	long grid	56	1236 286	10.5 6.9 26.0 21.6 27.2	27.2
CUL-DE-SAC without lanes	short cul-de-sac	22	523 266	9.4 6.9 29.6	23.0 29.0
	long cul-de-sac	38	843 266	10.0 7.4 25.5	21.7 25.2
CUL-DE-SAC with lanes	short cul-de-sac	22	533 286	9.4 6.3 30.0 29.6 23.5	30.0
	long cul-de-sac	38	853 286	10.0 6.8 25.8 25.6 22.0	25.8
LOOP without lanes	short loop	36	532 459	9.0 6.4 30.6	30.3 31.7
	long loop	68	532 779	9.8 7.0 25.6	25.4 26.2
LOOP with lanes	short loop	36	572 469	8.9 5.8 31.7 28.3 31.8	34.4
	long loop	68	572 789	9.7 6.6 26.2 24.4 26.0	26.8
LOOP WITH CENTRE GREEN without lanes	short loop	24	532 459	8.5 4.3 45.9	45.4 47.6
	long loop	40	532 779	9.3 4.2 43.5	43.2 44.6
LOOP WITH CENTRE GREEN with lanes	short loop	24	572 469	8.5 4.2 46.3 30.0 45.8	48.0
	long loop	40	572 789	9.3 4.0 43.8 26.0 43.5	44.8



GROUPING OF HOUSES

A project containing a number of identical houses is likely to be most economical. But this may not provide a sufficient variety of accommodation and the monotonous effect is objectionable. Rather than attempting to relieve the monotony by superficial variations to the facades of houses it is preferable to use true variations of plan to create individuality and give character to a group of houses.

If houses of different types are simply mixed at random along a street frontage the design of each individual house is least effective. The characteristic shapes and roof-pitches of bungalows, 1½-storey and 2-storey houses can however be used in combination to give interesting effects in architectural composition. Group composition therefore becomes the most important feature in the design of single-house projects.

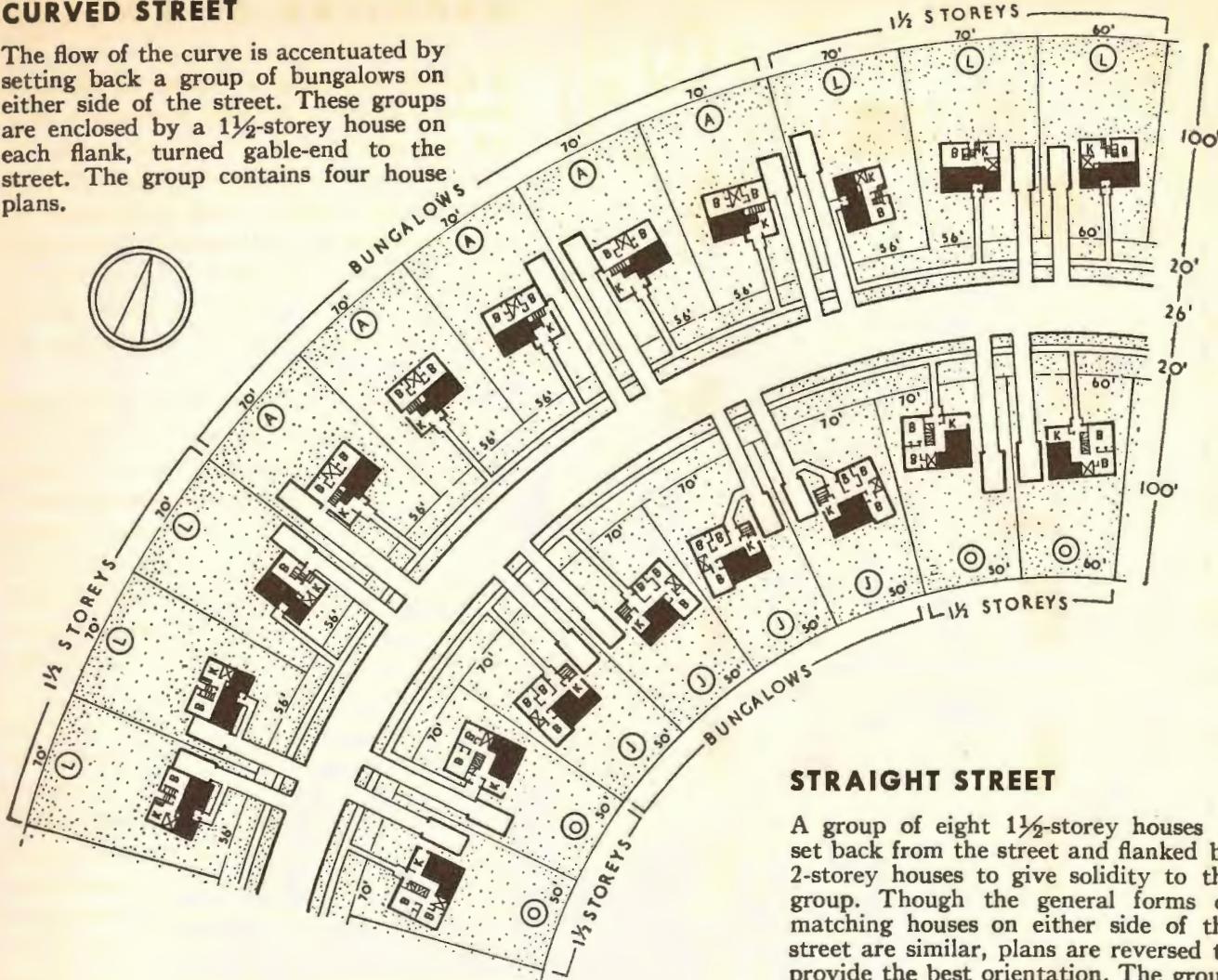
The accompanying plans illustrate some examples of housing groups. The house plans are selected from those shown on a previous page. Houses are shown in groups on a cul-de-sac, a curve, a straight street, a corner and an intersection. In each case bungalows, 1½-storey and 2-storey houses are shown in combination, the houses being placed so as to give coherence to the group. Each group is seen to enclose a space and to be visible as a single unit of design.

The correct siting of each house plan depends not only upon the shape of the house but also upon the orientation of the living room and the service entry. Requirements of sunlight may determine that the living room should face towards the street or towards the garden side. There are advantages in coupling the garage and service sides of adjoining houses. These requirements have been considered in the examples illustrated.

These plans of house groups do not show the scheme of tree-planting which should form an essential part of any composition. The landscape treatment should be designed to accentuate the shape and space-enclosure of each group of houses.

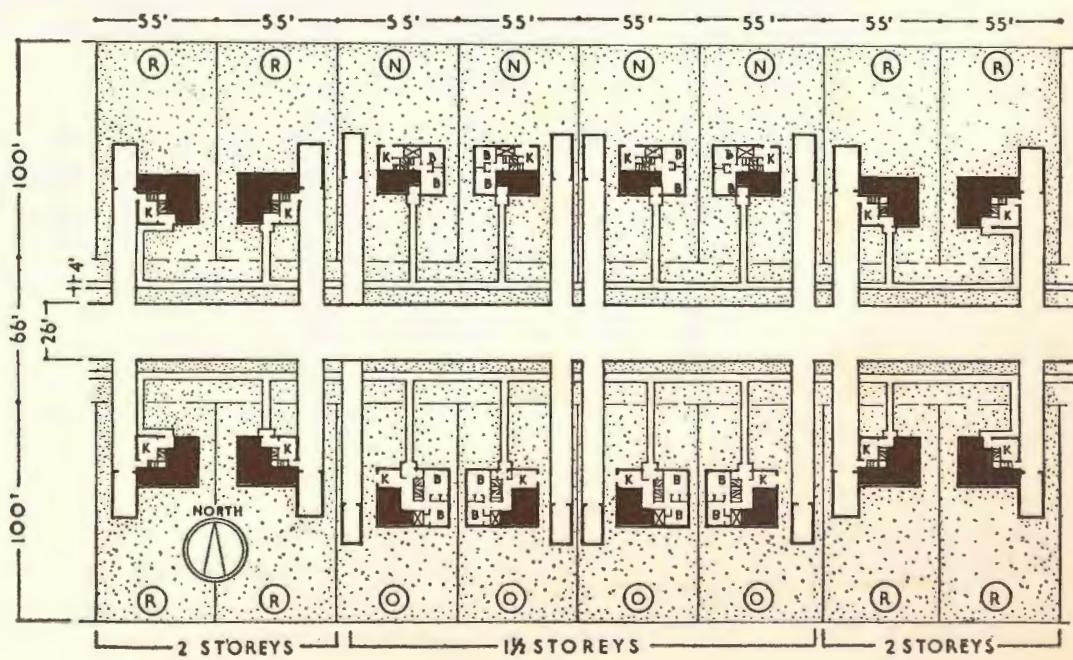
CURVED STREET

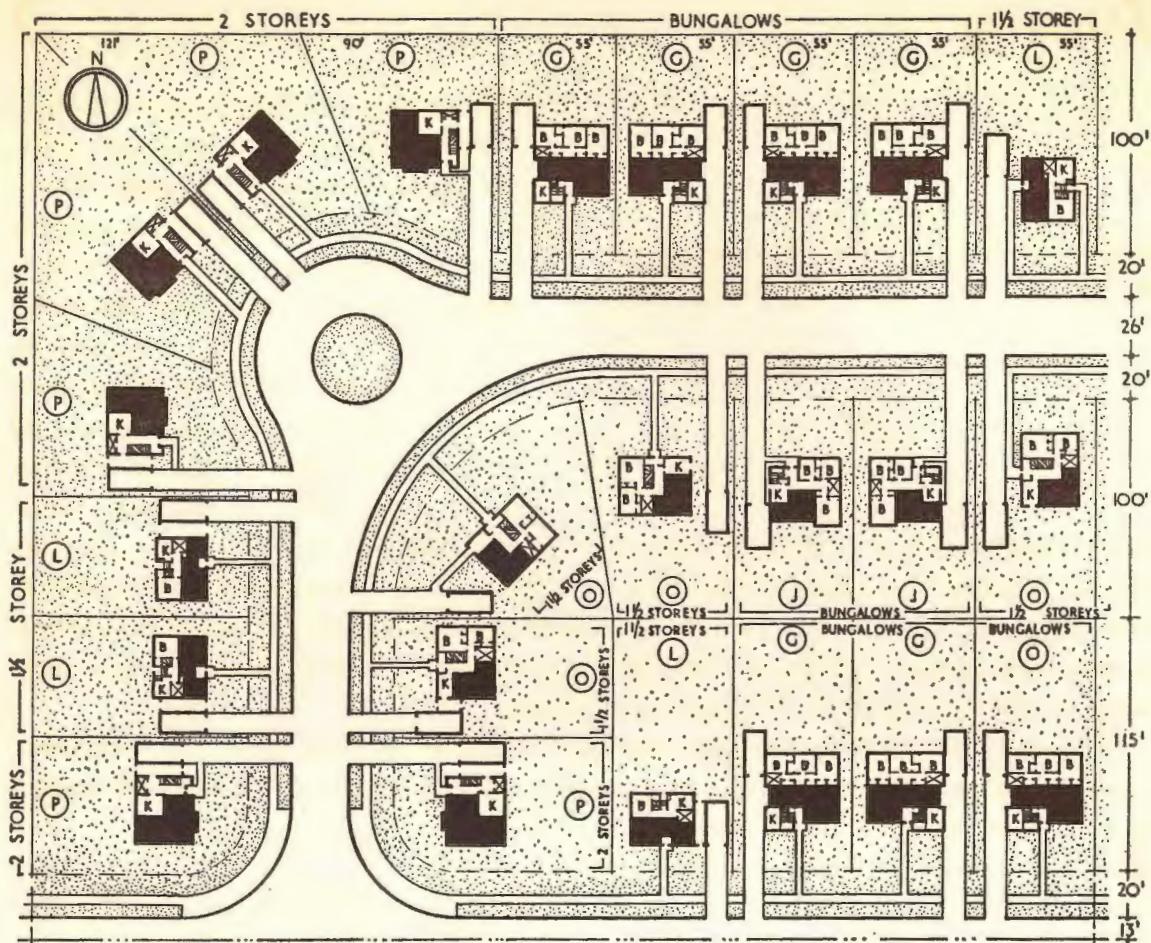
The flow of the curve is accentuated by setting back a group of bungalows on either side of the street. These groups are enclosed by a $1\frac{1}{2}$ -storey house on each flank, turned gable-end to the street. The group contains four house plans.



STRAIGHT STREET

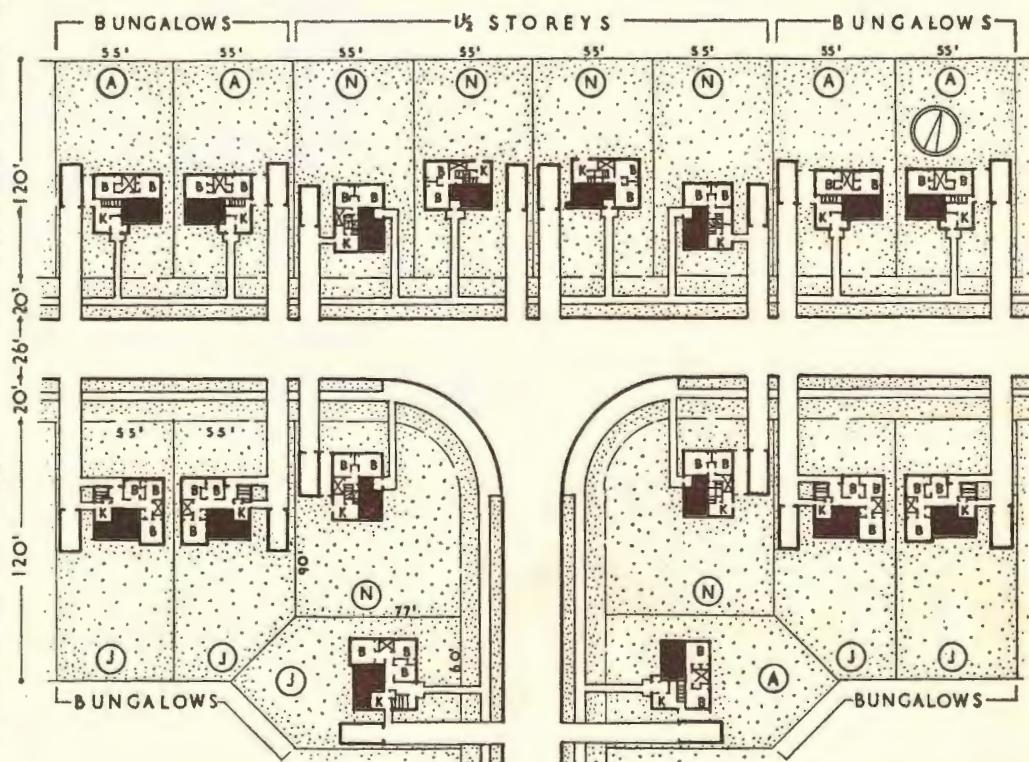
A group of eight $1\frac{1}{2}$ -storey houses is set back from the street and flanked by 2-storey houses to give solidity to the group. Though the general forms of matching houses on either side of the street are similar, plans are reversed to provide the best orientation. The group contains three house plans.





STREET CORNER

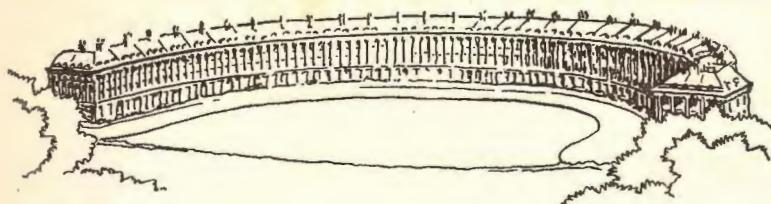
Houses on the corner are set back and raised to 2 storeys to give an enclosure to the turning circle. 1½-storey houses are used to carry the eye around the interior curve and the group is flanked by 1½-storey house gable-end to the street. The group contains five house plans.



INTERSECTION

1½-storey houses are grouped at the intersection and flanked by two types of bungalow to give the required orientation. The siting of houses on the corner gives good traffic visibility. The group contains three house plans.

Row Housing



Bath 1775

green squares with residences of delightful architectural style. In Ontario, Quebec and the Maritime provinces there are some pleasant early examples of Row Housing. This is an essentially urban form of design, imparting a civic character to a group of small dwellings, combining most of the amenities of the individual house with some of the compactness of apartment houses.

It is also true that in the early periods of industrial cities some of the poorest housing was built in the form of terraces and rows. The so-called "By-Law Housing" of Victorian English cities demonstrated the danger of accepting minimum standards in the lay-out of such dwellings. Like any other form of design, row housing can be carried out either with architectural distinction or with depressing effect.

Though there are many early examples of row housing in Canada little has been built in recent years. Interest has been revived, however, in the search for types of building that would be economical in construction, land coverage and maintenance costs. While the single house provides the most suitable conditions for family living it is recognized that it cannot easily be given a satisfactory character and dignity when built under mass-production conditions of economy. On the other hand the apartment-house, however appropriate for large-scale building operations, is not a suitable place in which to raise a family. As a compromise, row housing overcomes both these difficulties. The excellent quality of domestic architecture that can be achieved in this



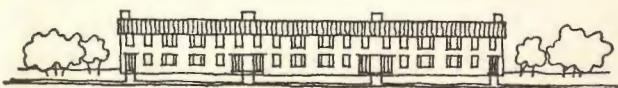
Ottawa 1863

Park Forest 1947



form has been especially demonstrated in England where a large proportion of post-war housing has been of this type; in the United States there is also a new interest in the use of row housing.

Row housing provides two of the essential features of a family home—an individual front-door and some



Rows of single small dwellings are monotonous.
Row Housing groups dwellings into finer buildings.

private garden space. Each unit in a row is essentially a private house. At the same time repetition of design is accepted as an essential feature of economical building. Within a single building containing six or eight dwellings the repetition of identical doors and windows gives architectural rhythm and scale, whereas the same number of identical small dwellings separated into single houses, are likely to be monotonous in effect. In a project of row housing a certain dignity is achieved because the buildings are larger elements in the composition.

The production of housing in Canada has been geared to the unit of the single house standing on its own lot. Methods of land-subdivision, construction practices and financing arrangements are largely based on this familiar form which fulfils the traditional objectives of home-ownership. It is argued that row housing does not offer the advantages of a single house in single ownership, a property that can be produced, occupied and sold separately. It certainly requires a different form of land subdivision, a larger unit of investment in construction and a continuing responsibility for rental management. But on account of its suitability for family living, it is to be regarded as a most useful addition to the housing accommodation of a Canadian city; particularly because it is the form of rental housing which can most easily be blended into areas of single family houses.

Row housing offers very great varieties of design, depending upon the number of dwellings combined into a row and the number of rows arranged in a group. It is found that a row of four, six or eight dwellings makes a building of pleasant proportions; unless there is a break in levels or frontage a longer building is monotonous and is awkward in the provision of rear access. However satisfactory the design of a single row house building may be, a straight line

repetition of such buildings is most unsatisfactory. Nor can the monotony of such a street alignment be effectively relieved by minor variations of colour and design. There are, however, many ways of grouping row housing in relationship with streets and open spaces so as to give individual character to each group; in this respect row housing offers opportunities for interesting and varied development which cannot be achieved in developments of small single houses.

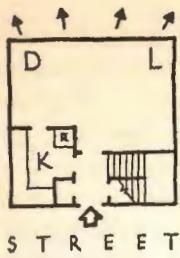
The character of row housing design depends also upon the extent to which each dwelling is considered as an individual unit on its own lot or whether the whole row is regarded as a building surrounded by common open space. Or there may be a compromise by which each dwelling is provided with a small private outdoor space while the majority of surrounding open space is accessible to all. The most desirable arrangement will depend upon the type of householder for whom the housing is intended and upon local experience. In metropolitan areas where tenants are accustomed to apartment-house living and tenancies are usually short-term, the amount of private outdoor space may be reduced to a minimum. In smaller communities and where families are likely to remain as tenants for a considerable length of time



Site Planning provides landscaped open spaces between groups of Row Housing.

it may be assumed that tenants will be able to maintain a garden and so require a lot-space like that associated with a single house.

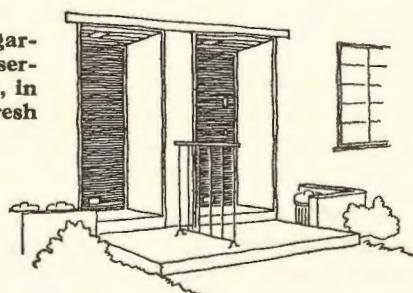
Some of the previous ill-repute of row housing arose from efforts to squeeze each dwelling into a narrow frontage, leading to a dark interior without through ventilation. In contemporary versions of row housing the dwelling plans provide a room arrangement and general proportions similar to those commonly used for small single houses. With a building not more than 30 feet deep (preferably 24 feet) and a wide aspect to the living-room plenty of light and air may be provided. It is necessary, of course, that the intervening walls provide sound insulation, particularly against impact noises.



Kitchen is near to service street entrance. Living Room faces onto garden and view.

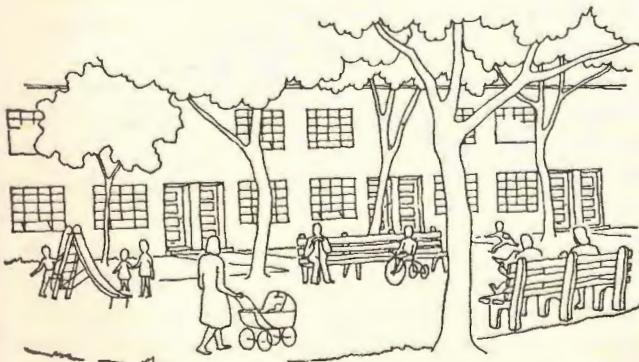
In order to preserve the privacy of the space in rear of each dwelling in a row it is most satisfactory to regard the street entry as both front door and service entrance. For this reason the kitchen is best placed on the street side of the house with direct

Low walls screen garbage cans outside service street entrance, in Row Housing at Fresh Meadows, N.Y.



access to the door for delivery and garbage removal. (The design must provide for screening of garbage cans). The rear side of the dwelling may then be used for a wide frontage of the living room with a door to an outdoor terrace and recreation area.

The special advantages of row housing depend upon a skilful planning of the site so as to make the best use of open spaces and so as to provide convenient service access. When buildings are arranged in groups withdrawn from the main traffic street it is possible to obtain a pleasant degree of privacy and also to economize in the costs of street construction. The most successful contemporary examples have been constructed on comparatively large sites where the planner has had space to develop such group arrange-

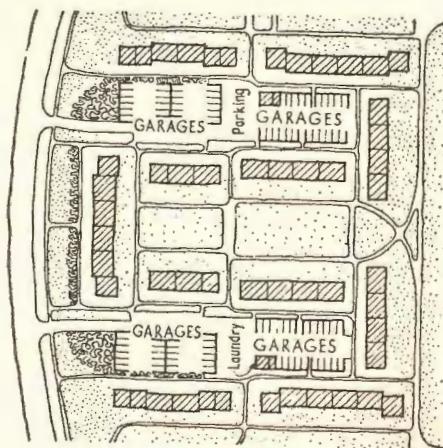


Children's play areas in open spaces separated from street, serving group of Row Housing families.

ments rather than give row housing a frontage on to traffic streets. The success of these plans has depended very much on the completion of landscape features and surface treatments so as to define the circulation routes, parking areas, drying yards, play areas and private spaces.

The need for careful planning and landscape treatment of row housing sites imposes on developers a task which does not arise to the same extent either in single house or apartment house developments. It is expected that the occupants of single houses will each landscape their lots and streets are the responsibility of the municipality. Apartment houses are sometimes provided with parking and garage space but it is commonly (and too readily) assumed that recreation space will be provided by the municipality. On a row housing site most of the landscape treatment has to be carried out and maintained by the developer and it is likely that the construction and maintenance of access driveways will also be his responsibility. Not only must the initial cost of these features be considered but also their subsequent care must be financed and the co-operation of the tenants be secured.

The provision of garages and off-street parking is an essential feature of row housing. This is most



Parking areas separated from street and accessible to groups of Row Housing, at Baldwin Hills Village, Cal.

conveniently done in the form of compounds on the interior or service sides of building groups. These hard-surface areas may also be used as play spaces and should therefore be separated from traffic circulation.

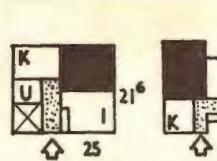
The following pages provide some examples of Row Housing plans, followed by a brief analysis of Orientation, the arrangement of Services and some examples of Site Planning.

SOME BASIC TYPES OF ROW HOUSE PLANS

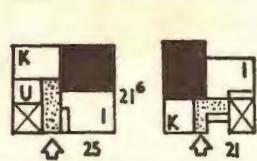
without basements

BUNGALOWS

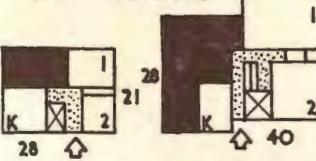
ONE BEDROOM



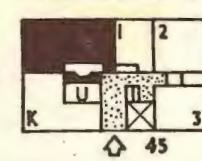
TWO BEDROOMS



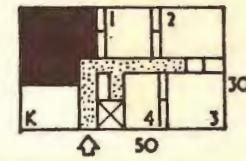
TWO BEDROOMS



THREE BEDROOMS



FOUR BEDROOMS



TWO STOREYS

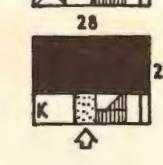
LIVING ROOM TO FRONT



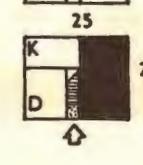
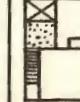
2 BEDROOMS



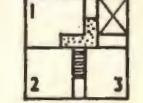
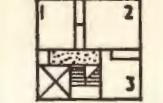
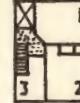
LIVING ROOM TO REAR



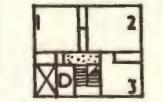
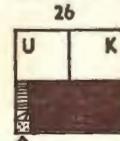
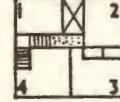
LIVING ROOM THROUGH



3 BEDROOMS



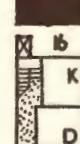
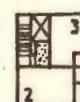
4 BEDROOMS



GRADE ENTRANCE

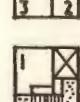
THREE STOREYS

LIVING ROOM TO FRONT



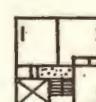
3 BEDROOMS

LIVING ROOM TO REAR



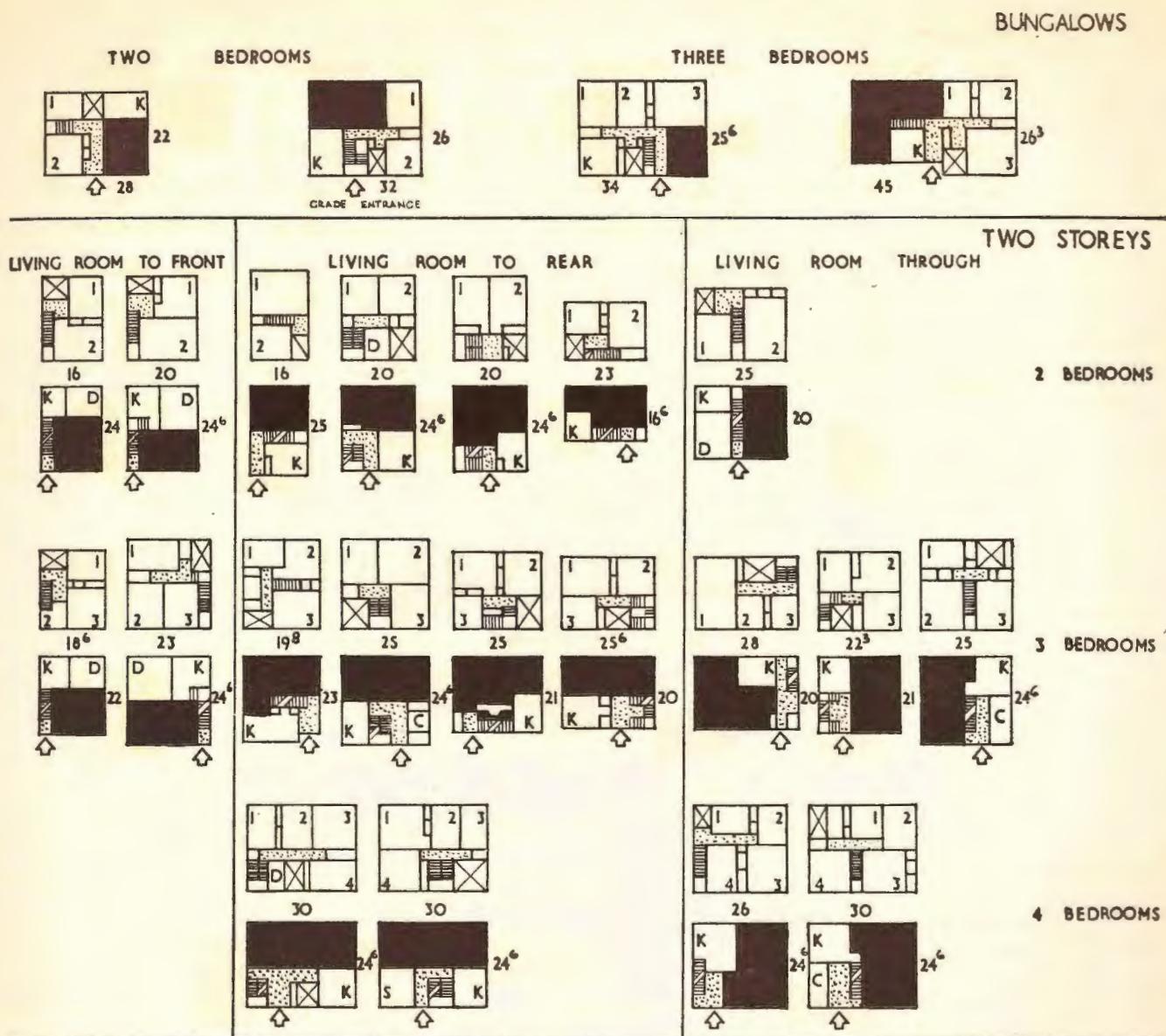
4 BEDROOMS

LIVING ROOM TO REAR



4 BEDROOMS

with basements



10 0 10 20 30 40 50
SCALE IN FEET

Contemporary Row House Plans

The fifty plans illustrated are representative of both British and American Row Housing, both basementless (left page) and with basements (right page). They show various types, classified according to the number of bedrooms and according to the orientation of living room.

The plans are diagrammatic to show relationship of room spaces. Living areas are blacked in, bathrooms, etc., are marked with a cross, utility rooms with a U and access halls are stippled.

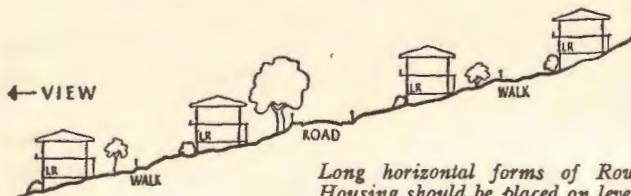
ORIENTATION

A dwelling in Row Housing has only two aspects, front and back. Orientation to sunlight is therefore a more critical factor than in the siting of single houses which may obtain light on all four sides.

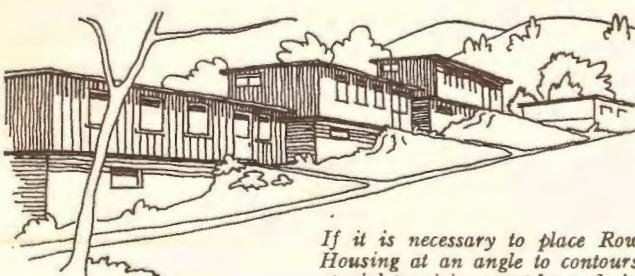
In a small project the orientation of row housing is likely to be determined by the existing form of land subdivision and street pattern. In a larger project, however, it may be possible to establish the most desirable orientation by evaluating several factors, particularly sunlight, slope of the land, access to street and open spaces, views and winds.

There are diverse opinions as to the ideal orientation to sunlight, depending upon personal preferences and upon the relative values of sunlight and shade in different climates. There are, however, certain conditions which should preferably be avoided in Canada. If possible row housing should not be sited so as to give an approximately North-South or East-West aspect to dwellings, for the following reasons.

In a North-South row building all dwellings face East and West and consequently no direct sunlight enters rooms throughout the greater part of the day.



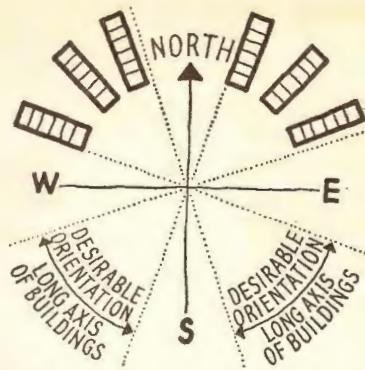
Long horizontal forms of Row Housing should be placed on level ground. On sloping sites, therefore, the buildings should be parallel to contours. This will determine the street plan for a Row Housing development.



If it is necessary to place Row Housing at an angle to contours special provision must be made in the design of the buildings. This may produce interesting results.

During the latter part of the day the sun will strike the West side at a low angle and, throughout a great part of the year, make it necessary to screen windows. On the other hand an East-West row building will give satisfactory sunlight on the south side of each dwelling but there will be no direct sunlight to any rooms on the north side. Furthermore the continuous shade on the north-side walls and ground cause an inconvenient accumulation of snow and ice. These considerations suggest that the most desirable orientation is obtained when the long axis of row housing lies at an oblique angle to the North-South axis.

Buildings on sloping ground are most economically sited parallel to the contours so as to maintain horizontal footings and streets. A sloping site offers an



invaluable opportunity to break the uniformity of a large number of buildings of the same height and length; even quite minor changes of level are effective in accenting the layout of a group of buildings, and in introducing variety of setting and landscape treatment. Though more expensive to construct there have been some interesting experiments in siting row housing across the contours of a slope, giving a stepped formation and greater individuality to each dwelling.

On a site which possesses some interesting topographical feature such as a grove of trees or an open view, this may prove to be the primary factor in determining orientation. Such features are sufficiently rare in the residential areas of Canadian cities and they may add a quality to housing preferable even to sunlight and some other conveniences.

DENSITY

Row Housing may be preferred to single houses on account of the greater number of units that may be built on a given area of land. This may be an important factor where land costs represent a large proportion of the costs of housing. A density of 10-12 dwellings per acre may be regarded as a normal gross density (including the area of streets).

Row housing in British public housing estates conforms with the customary density of 12 dwellings to the acre. In Canada a similar grouping of buildings requires greater street area to carry more automobile traffic and a comparable figure would be 10 dwellings to the acre. A 66 ft. street allowance with 12 ft. setback for building line gives a total distance of 90 ft. between buildings; the space between buildings in British practice is usually about 75 ft.

In some United States cities densities as high as 20 and even 30 dwellings per net acre have been obtained where row housing has been built on high-value land. This can be achieved where row housing is compactly grouped without direct street access to each dwelling. At such high density it is questionable whether row housing is to be preferred to higher buildings with less land coverage.

Desirable net densities of building areas must be considered in relationship with adjoining open spaces. It is possible to concentrate buildings at high density with consequent economies in street construction provided that there is access to adjoining recreation areas and a reasonable neighbourhood density.

Scheme "A"

16 houses

Gross Density: 11.85 dwellings per acre

Net Density: 14.45 dwellings per acre

Land: 1.35 acres at \$1200 per acre \$1,670

Services:

Road paving (including curb): 2" asphaltic concrete on 6" compacted gravel base. Cost of one side of road only \$1,950

Sidewalk: concrete 5'0" wide, 4" thick \$ 550

Sewer and water main (laid in same trench). Half of cost because property owners on opposite side of road will share \$2,035

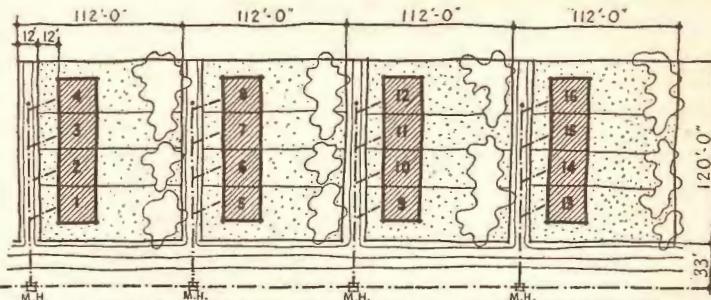
Connecting services to houses \$2,585

Total \$8,790

Cost per house for land and services: \$550

COMPARISON OF COSTS

On this page the three basic forms of layout for row houses are compared, with an analysis of the cost of services. The figures are based on costs prevailing in the Ottawa Area in September, 1952.



A

Scheme "B"

16 houses

Gross Density: 7.00 dwellings per acre

Net Density: 16.7 dwellings per acre

Land: 2.29 acres at \$1200 per acre \$2,748

Services:

Road paving (including curb): 2" asphaltic concrete on 6" compacted gravel base. Cost of one side of road only \$1,500

Sidewalk: concrete 5'0" wide, 4" thick \$ 375

Footwalk around Green: 2" bituminous penetration on 6" compacted gravel base \$ 316

Lane: 6" consolidated gravel \$1,000

Top soil and sodding for Green \$2,137

Sewer and water main (laid in same trench). Half of cost, because property owners on opposite side of road will share \$2,279

Sewer and water branches (laid in same trench) \$2,638

Connecting services to houses \$1,243

Total \$14,236

Cost per house for land and services: \$ 890

Note: Although the "Green" is an integral part of the design of Scheme "B", it represents public open space which should also be provided in conjunction with Schemes "A" and "C", although outside the actual limits of these layouts.

In order to achieve a more accurate basis of comparison, the cost of the "Green" can be deducted as follows:

Land: .47 acres at \$1200 per acre \$ 564

Topsoil and sodding \$2,137

Total \$2,701

Revised cost per house for land and services = $\frac{14,236 - 2,701}{16} = \721

Scheme "C"

16 houses

Gross Density: 10.20 dwellings per acre

Net Density: 14.4 dwellings per acre

Land: 1.57 acres at \$1200 per acre \$1,884

Services:

Road paving (including curb): 2" asphaltic concrete on 6" compacted gravel base. Cost of one side only \$2,000

Sidewalk: concrete 5'0" wide, 4" thick \$ 550

Footwalks: 2" bituminous penetration on 6" compacted gravel base \$ 780

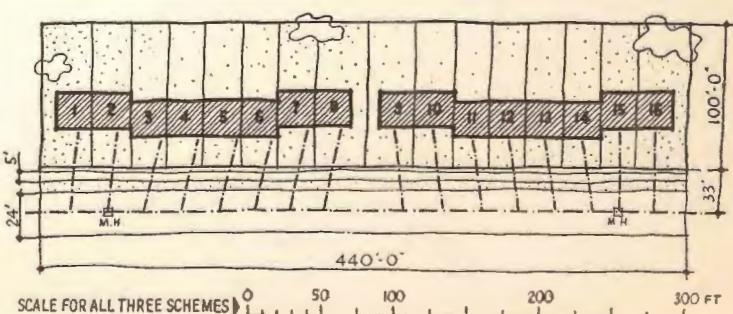
Sewer and water main (laid in same trench). Half of cost, because property owners on opposite side of road will share \$2,525

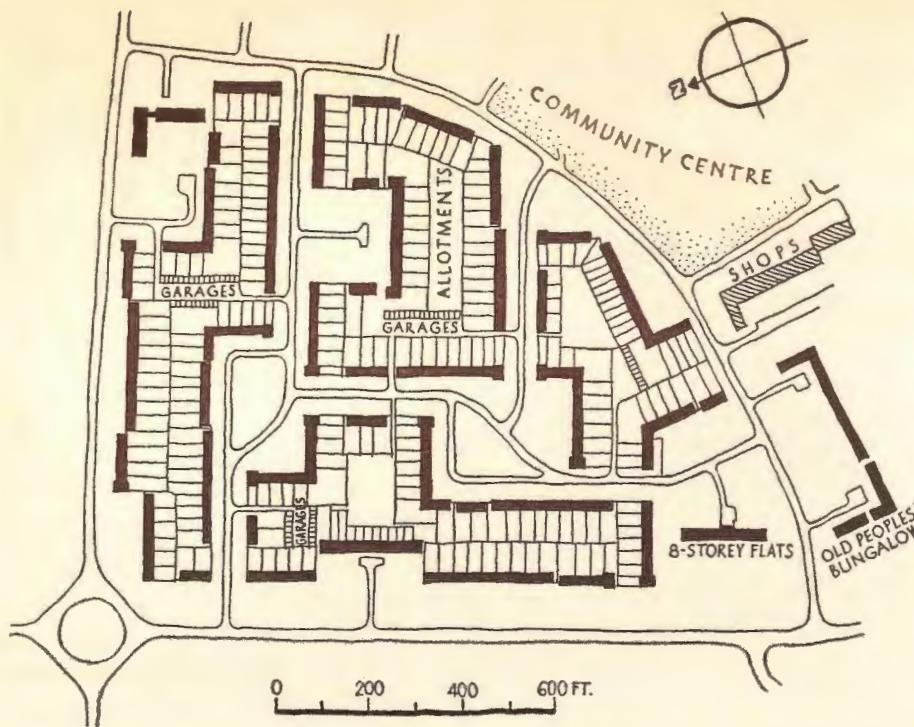
Sewer and water branches (laid in same trench) \$2,400

Connecting services to houses \$1,053

Total \$11,192

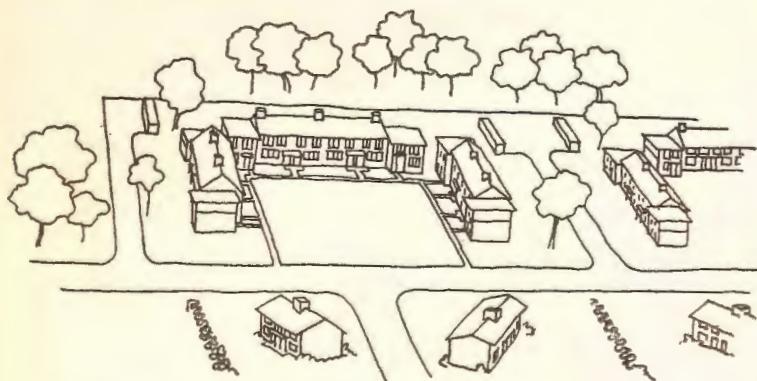
Cost per house for land and services: \$ 700





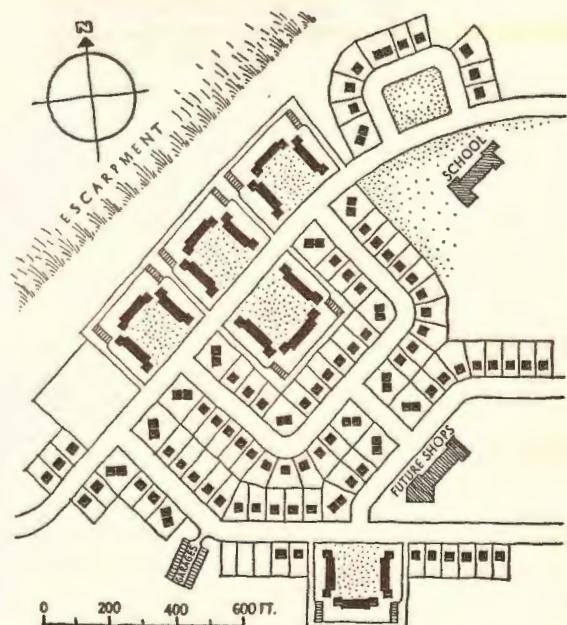
**From British
HOUSING MANUAL 1949**

Site plan suggesting desirable method of using standard building types to achieve variety of grouping and spaces.



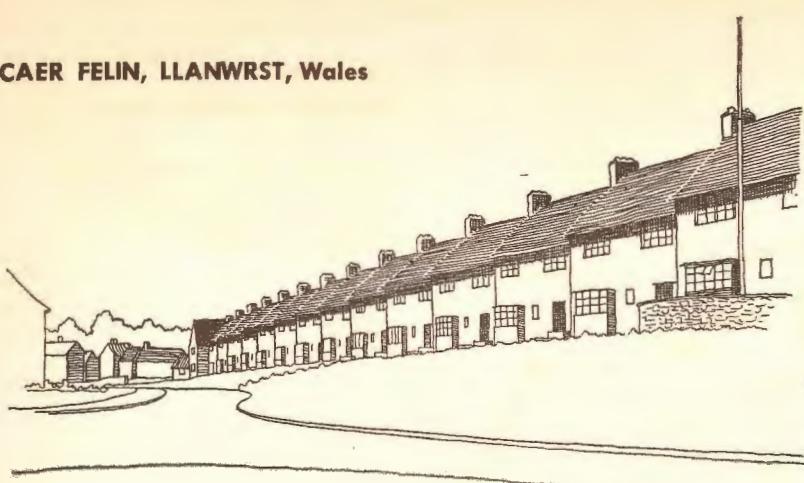
PICTON, Ont. Row Housing used in Canadian project for housing families of Army personnel.

Example from the HOUSING MANUAL published by the British Ministry of Health, 1949, representing about one third of a residential neighbourhood of a satellite town planned in accordance with standards advocated in the Manual. The area contains 2-storey row housing, two blocks of 3-storey row housing, one 3-storey and one 8-storey apartment block. Buildings are grouped around greens with space in rear for allotment gardens, with some garages. The area is surrounded by a circulation street and served by access streets, giving 22 linear feet of road per unit.

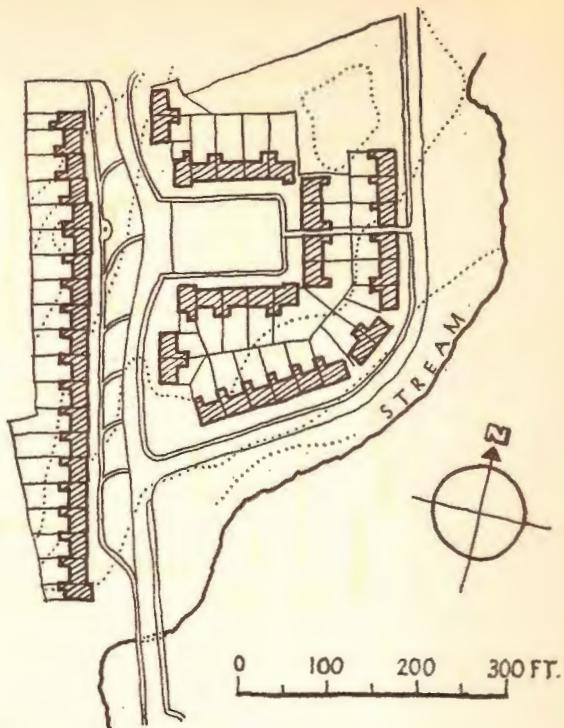


Housing Project, PICTON, Ontario, constructed in 1950 for Department of National Defence to house families of Army personnel. This is one of the few examples of row housing recently built in Canada, used here in conjunction with single-family houses to give diversity of accommodation. The row housing has been arranged in standardized groups located so as to close street vistas. Garages are provided for each row housing group.

CAER FELIN, LLANWRST, Wales

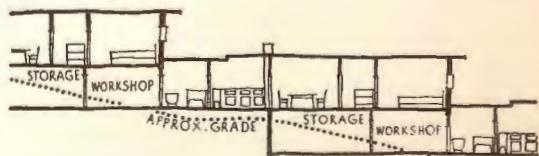
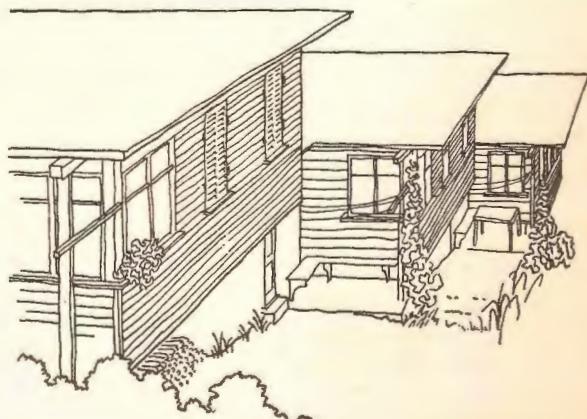
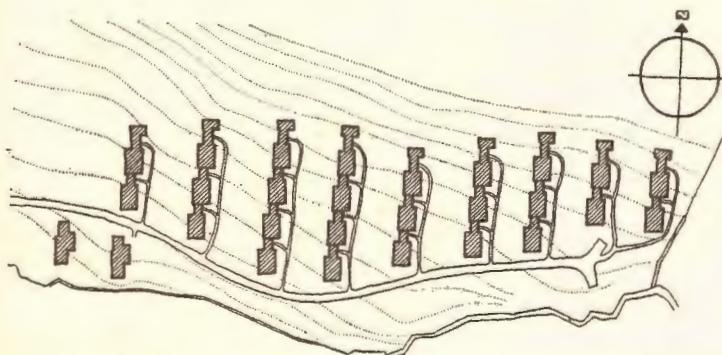


Row Housing blended into the topography of a rural site to create a compact composition.



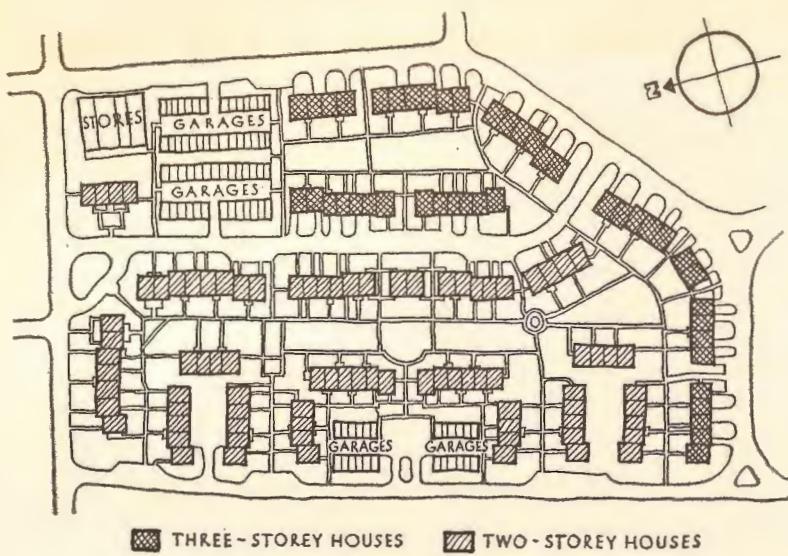
WADENSWIL, Switzerland

Sloping site used to give stepped housing with overlapping plans.



Public Housing at LLANWRST, Wales (Architect—S. Colwyn Foulkes) awarded the Ministry of Health medal for Welsh housing, 1950. What might be regarded as the awkward topography of the site has been used here to create a small project of distinctive character. The 52 dwellings are carefully composed into the landscape of a valley. Of particular interest is the shape and broken frontage of the long row of 20 houses and its relationship with the small quadrangle enclosed by row housing.

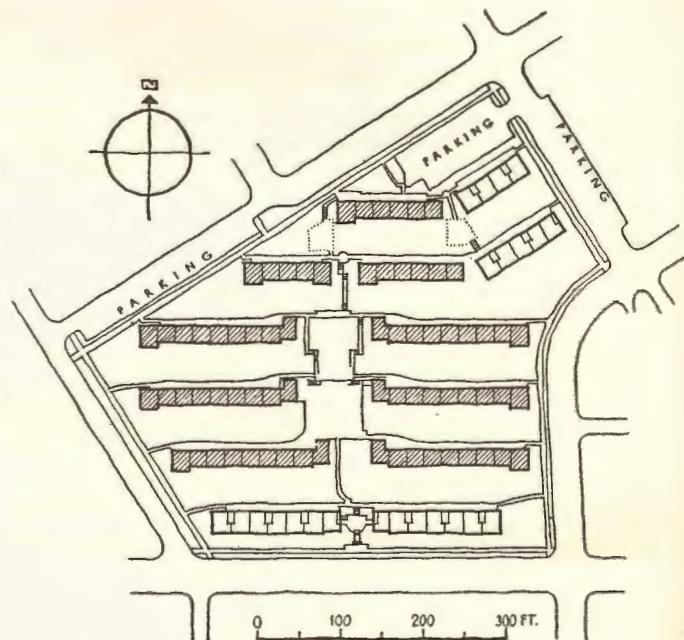
GWAD HOUSES, Wadenswil, Switzerland, a housing project of 3- and 4-bedroom houses for families of low income. A steep site has been used to provide an ingenious variation of row housing. Each dwelling is at one floor level, the living and sleeping area of one house being above the kitchen, laundry and basement of the adjoining house. Each dwelling is entered at ground level on the East side and has a private outdoor terrace on the West side.



CHATHAM VILLAGE, Pa.



YESLER TERRACE, Seattle



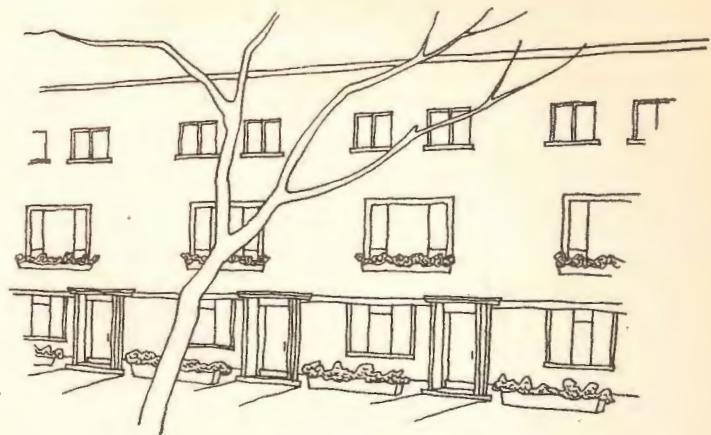
CHATHAM VILLAGE, Pittsburgh (Clarence Stein and Henry Wright, Site Planners and Consultant Architects), was built in 1933, four years after Radburn and three years before Greenbelt. It thus represents a midway stage in the evolutionary process for which Stein and Wright have been largely responsible. Houses face upon the inner greens with their backs to access streets. Some garages are in compounds and small private gardens are provided. Of the 45-acre wooded hillside site, 16 acres are used for housing, 4 acres for recreation and 25 acres are left in woodland.

YESLER TERRACE, Seattle (Architects—J. L. Holmes, J. T. Jacobsen, G. W. Stoddard, W. Aitken, W. J. Bain), is a low-rental public housing project administered by the Seattle Housing Authority. It was built in 1941 on the site of a central slum area and houses 868 low-income families. The area illustrated here houses 117 households. The site slopes down from North to South. In addition to 2-storey row housing there are 1-storey dwellings suitable for old people. In the West Coast climate the private gardens provide a luxuriant setting to the project.

Three-Storey Row Houses

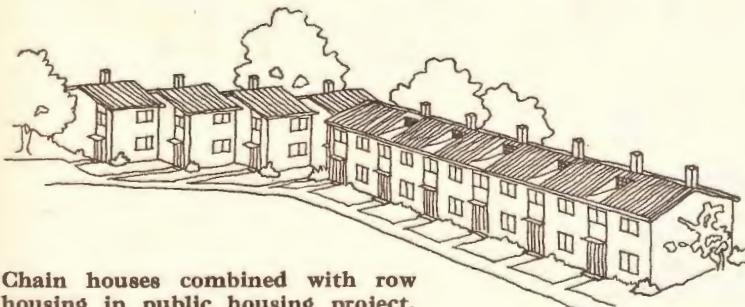
On urban sites requiring a high density of development 3-storey row housing may be used in place of 2-storey housing. Individual house frontages may be as little as 20 feet. While this form of housing is not currently used in North America (plans illustrated on page 24 are British) it may be preferable to 3-storey walk-up apartments of similar density but lacking the privacy of individual houses. 3-Storey houses may also be used where it is desirable to incorporate garages into buildings rather than group them in compounds. In such high-density developments there is some advantage in placing living rooms on the floor above ground level. (Illustration based on British Housing Manual).

OTHER VARIATIONS OF ROW HOUSES

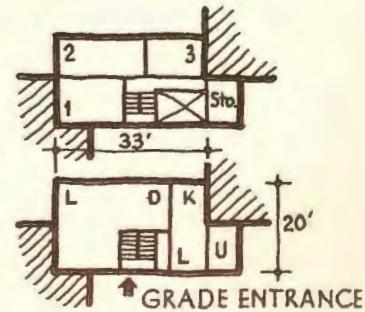


Chain Houses

This is a form of row housing in which a series of houses are attached but each one set back from the next. This arrangement provides greater privacy for each dwelling and is particularly adaptable to sloping sites. (Plan is of housing at Swarthmore College, Pennsylvania—Architects Bishop and Wright).

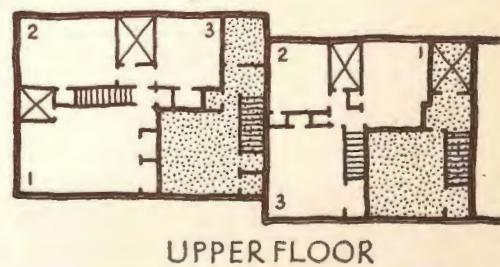


Chain houses combined with row housing in public housing project, Roehampton, London.

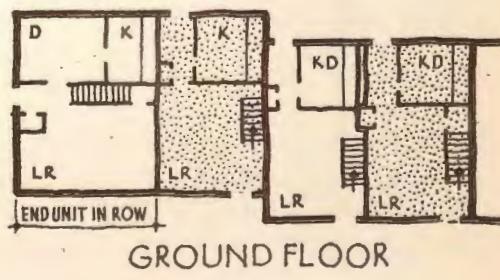


Interlocking Plans

In order to obtain variations of bedroom accommodation in row housing it may be convenient for adjoining units to overlap one another on the upper floor. The disadvantage of this arrangement is that each dwelling is not separated completely by vertical party walls. This may not comply with fire security regulations and there is also less insulation against noise between dwellings. It does, however, provide a greater flexibility of planning. (Plan is of housing at Fresh Meadows, New York—Architects Voorhees, Walker, Foley and Smith.)



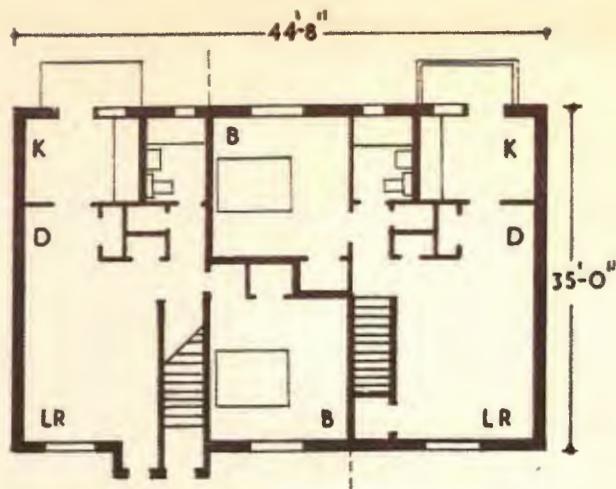
UPPER FLOOR



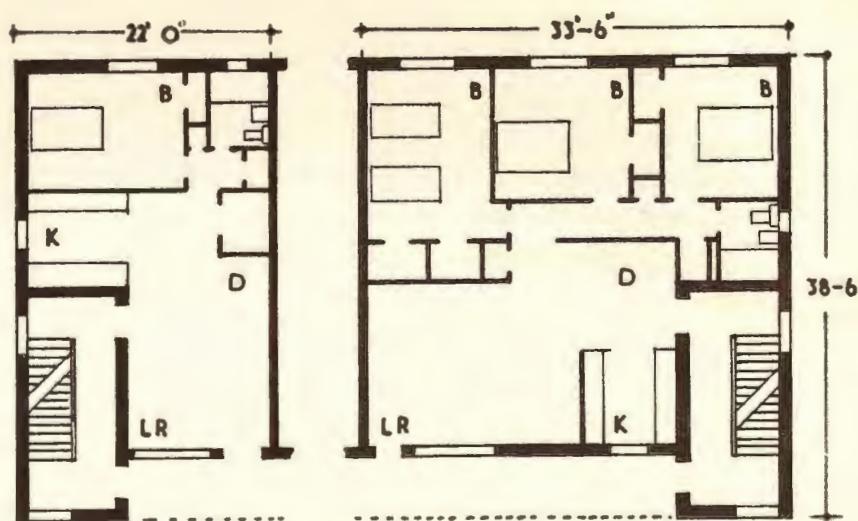
GROUND FLOOR

DUPLEX DESIGN

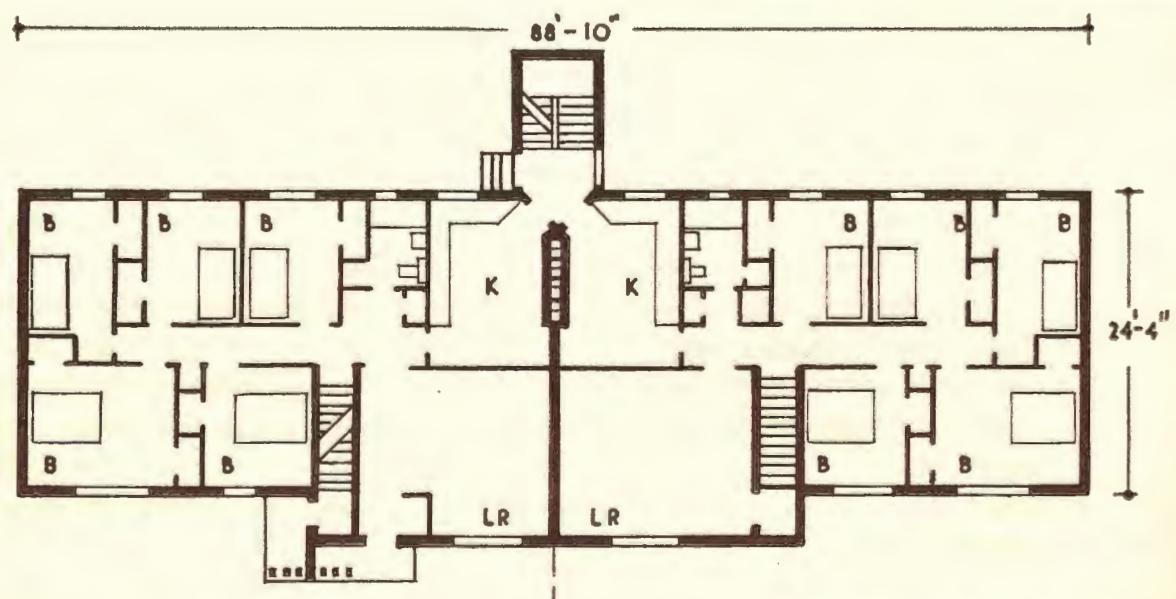
Examples of duplexes are illustrated here since they provide a form of building which is similar in appearance to 2-storey row housing and may be combined in grouped arrangements. Duplexes may be planned either with a single entry to serve upper and lower units or, for greater privacy, each unit may have a separate entry. As compared with row housing, there are some advantages in having all rooms of each dwelling on the same floor level and so giving a greater sense of space; on the other hand it is more difficult to define the exterior open space available to the occupants of each unit.



One Bedroom, Double Duplex



One and Three Bedroom, Double Duplex



Five Bedroom, Double Duplex

The form of building popularly known as "Garden Apartments" is an attempt to satisfy the needs of family living where single houses and row housing are not economic. Housing projects of this kind usually consist of a number of comparatively small three-floor buildings attached and grouped together so as to give the most direct access from each dwelling unit to the open space in which the buildings are set. The fewer the number of dwellings served by each ground-floor access and each stairway the greater is the privacy and domestic character of this housing. It is a form of building to be distinguished from the large apartment house with internal corridors serving a number of units, a condition not so appropriate for family living.

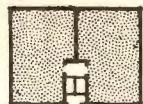
The plans of such individual apartment buildings may be classified in accordance with the system which is illustrated on the following pages. The simplest and most domestic form of walk-up building has only two units at each floor level. This type of simple rectangular plan may be extended to form a strip of building and may be elaborated to contain three or four or more units at each stair landing. Other types of plan are in the form of an L, T, Z or X. Some prototypes of each form of plan are illustrated together with examples of site arrangements by which a number of buildings can be grouped together to form projects of various compositions.

The varieties of plan are distinguished by the manner in which the dwelling units at each floor level stem from the stairway which forms the spinal column of the building. The most economical forms of plan that have been developed in Britain and the United States depend upon a single stairway to each building. The types of plan available for Canadian use are, however, greatly restricted by the need for a secondary staircase within the building; in a northern climate it may not be considered safe to rely upon outside staircases which may be coated with snow and ice when required in an emergency. The plans shown here illustrate the difficulty of devising varieties of plan that would satisfy Canadian building codes and the consequent tendency to rely upon the simplest form of "strip" plan in which the secondary internal staircase can most easily be provided.

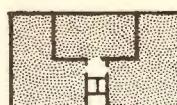
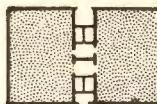
The development of apartment-house planning has been greatly restricted by the normal forms of land subdivision; the proportions of individual lots suitable for single houses do not lend themselves to other uses. Proper orientation and open aspect for apartment dwellings can only be obtained where there is sufficient space on which to compose a group of buildings. In such cases the architectural effect can be obtained from the simple masses of building groups and tree planting rather than from expensive embellishments.

ACCESS VARIATIONS OF THE SIX BASIC WALK-UP BUILDING TYPES

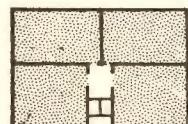
STRIP TYPE



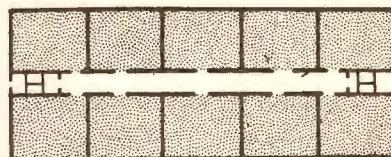
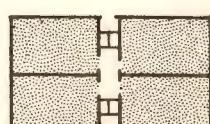
TWO TO A LANDING



THREE TO A LANDING

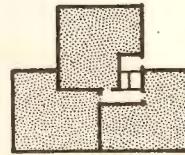
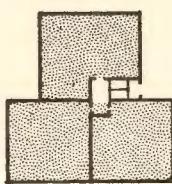
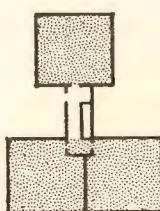


FOUR TO A LANDING

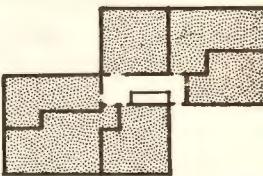
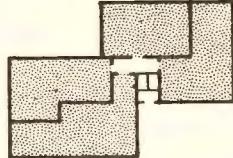
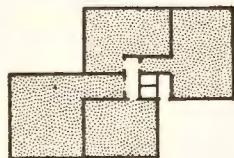
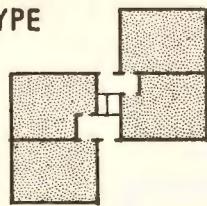


MORE THAN FOUR TO A LANDING

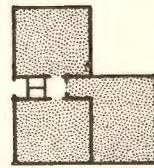
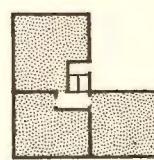
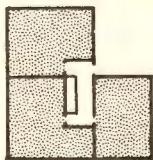
T - TYPE



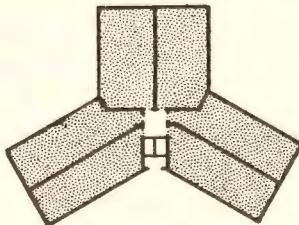
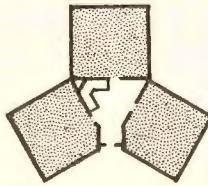
Z - TYPE



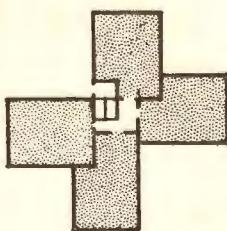
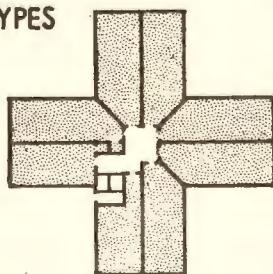
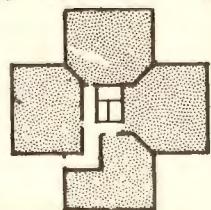
L - TYPE



Y - TYPE



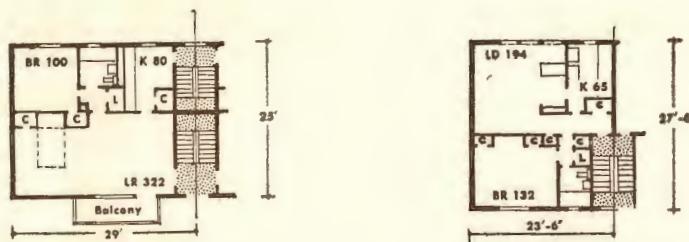
CROSS & OFF-SET CROSS TYPES



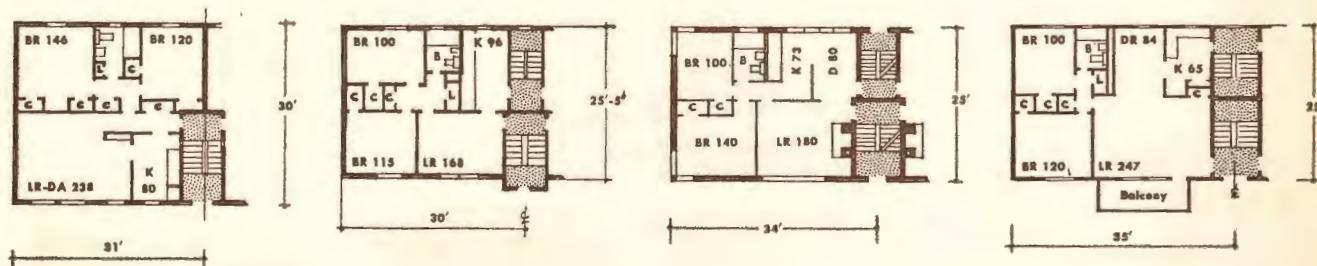
TWO DWELLING UNITS TO A LANDING

Strip Type Plans

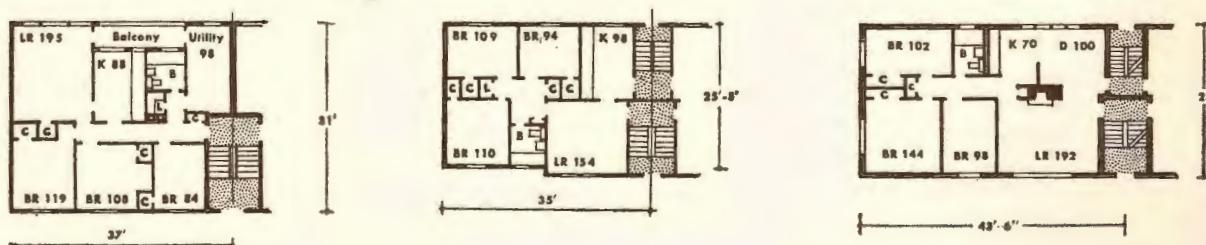
One Bedroom



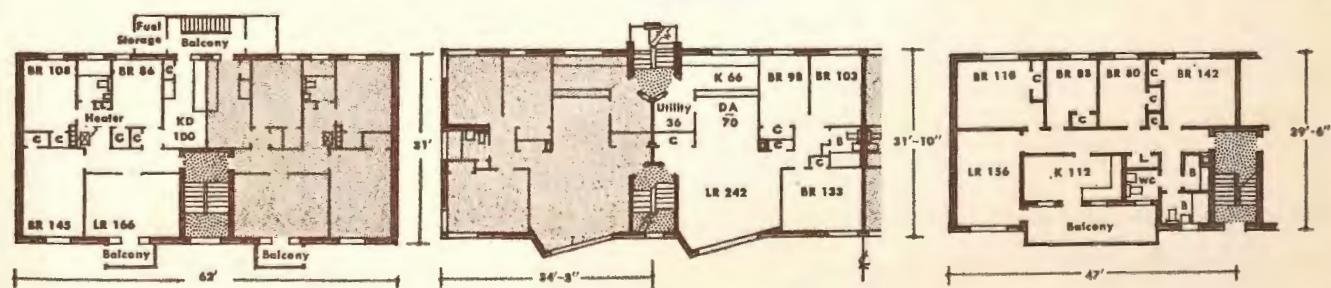
Two Bedrooms



Three Bedrooms



Four Bedrooms

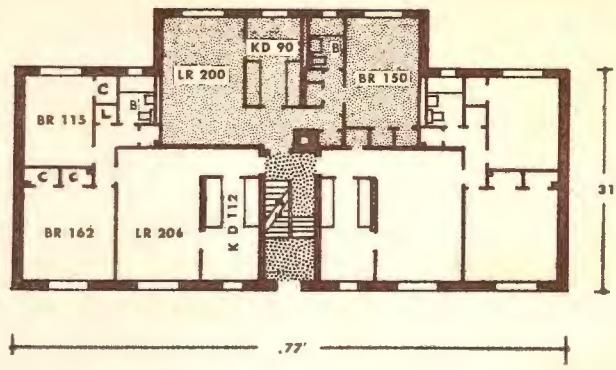
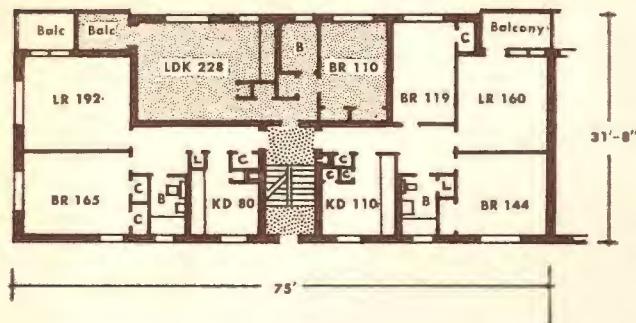


Type of "Cold Flat" Typical of Montreal

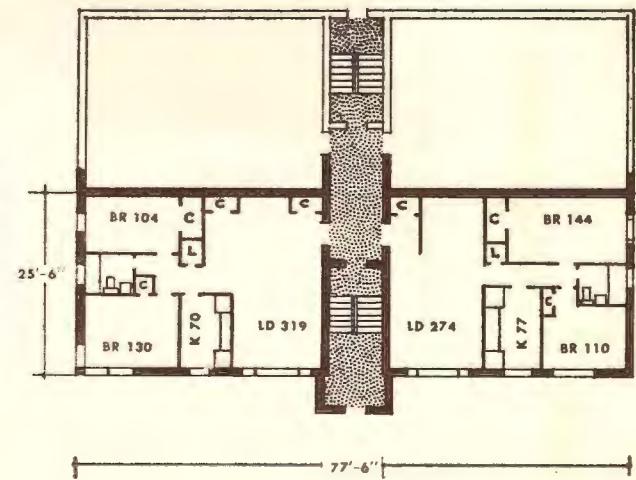
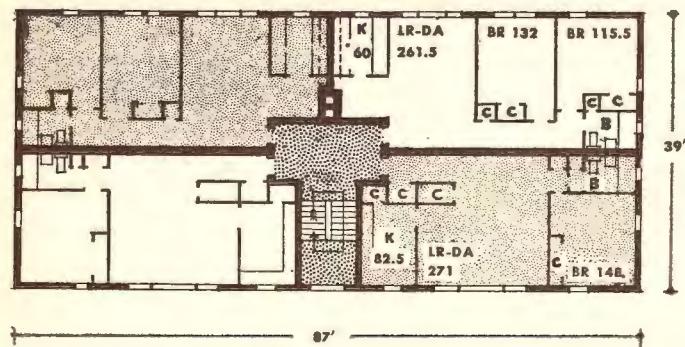
SCALE FOR FLOOR PLANS
10 5 0 10 20 30 40-Feet

Strip Type Plans

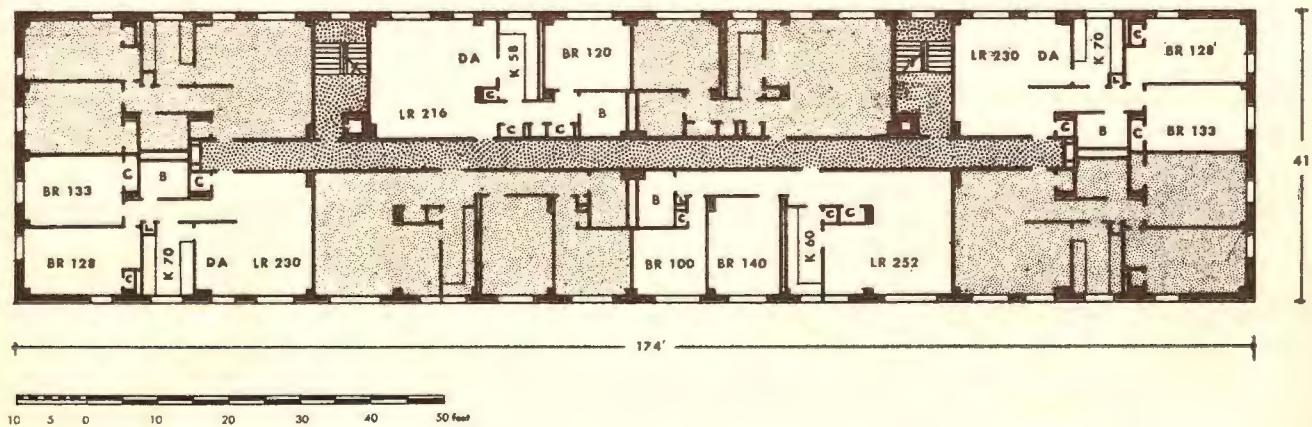
THREE DWELLING UNITS TO A LANDING



FOUR DWELLING UNITS TO A LANDING



EIGHT DWELLING UNITS TO A LANDING



GROUPING OF STRIP TYPE PLAN BUILDINGS

The diagram illustrates various combinations of strip types for plan and combined strip types. The top row shows the basic combinations: L-TYPE, T-TYPES, Z-TYPES, Y-TYPES, and CROSS & OFF-SET CROSS TYPE. The remaining rows show the combinations of these basic types.

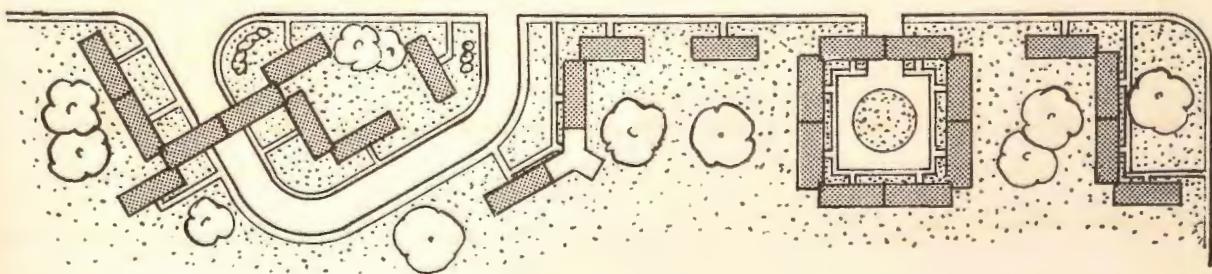
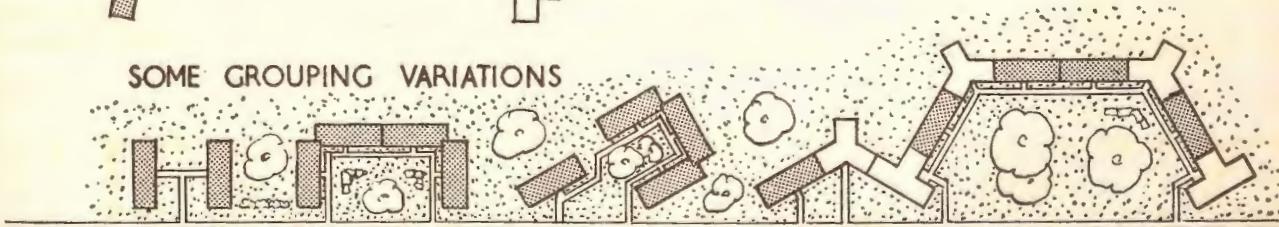
Basic Combinations:

- L-TYPE
- T-TYPES
- Z-TYPES
- Y-TYPES
- CROSS & OFF-SET CROSS TYPE

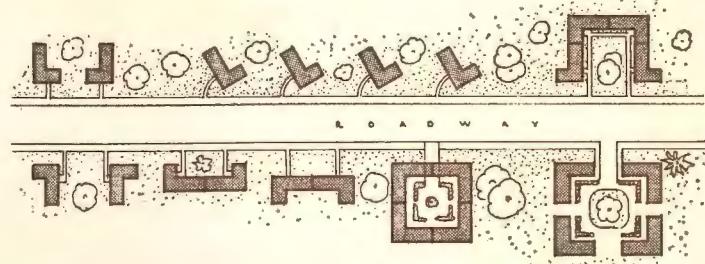
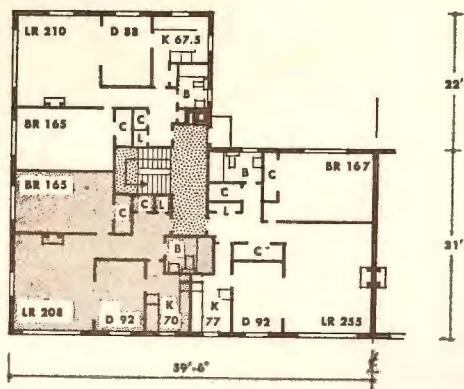
Combinations of Basic Types:

- L-TYPE + L-TYPE
- L-TYPE + T-TYPES
- L-TYPE + Z-TYPES
- L-TYPE + Y-TYPES
- L-TYPE + CROSS & OFF-SET CROSS TYPE
- T-TYPES + T-TYPES
- T-TYPES + Z-TYPES
- T-TYPES + Y-TYPES
- T-TYPES + CROSS & OFF-SET CROSS TYPE
- Z-TYPES + Z-TYPES
- Z-TYPES + Y-TYPES
- Z-TYPES + CROSS & OFF-SET CROSS TYPE
- Y-TYPES + Y-TYPES
- Y-TYPES + CROSS & OFF-SET CROSS TYPE
- CROSS & OFF-SET CROSS TYPE + CROSS & OFF-SET CROSS TYPE

SOME GROUPING VARIATIONS

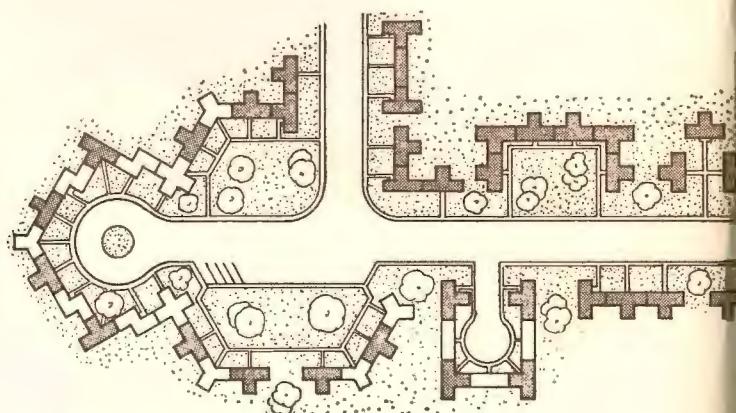
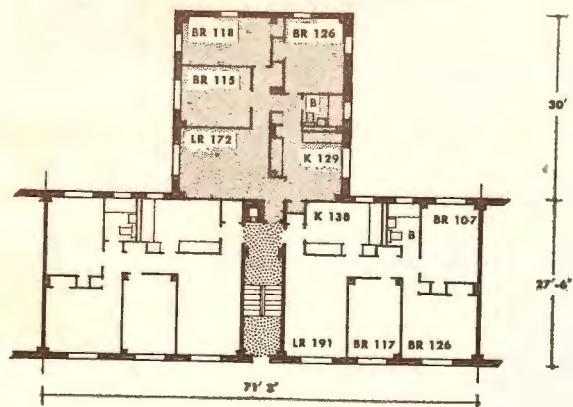


L - Plan Type



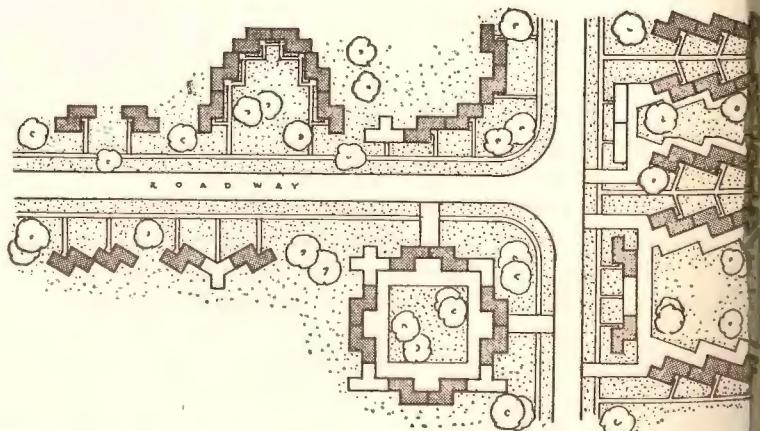
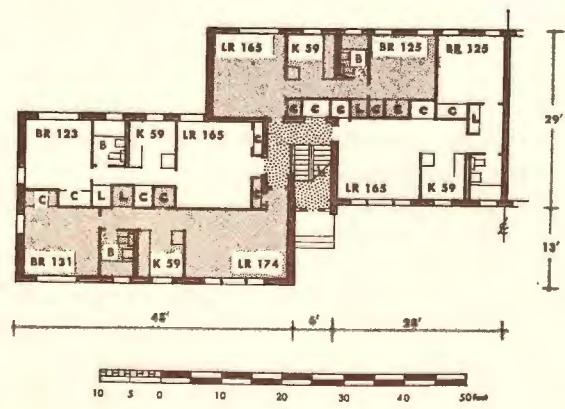
Some Grouping Possibilities Using L Shapes Only

T Plan Type



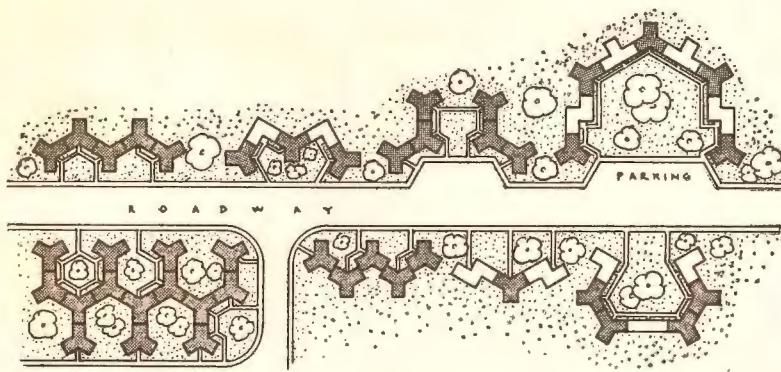
Grouping Possibilities for T Plan Type Buildings

Z Plan Type

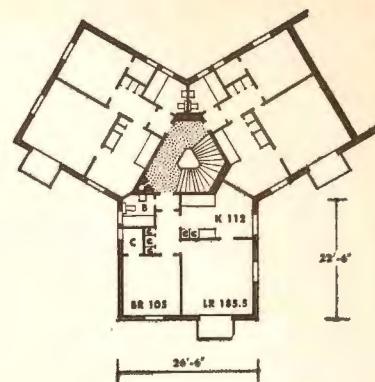


Grouping Possibilities Using Z Plan Type Buildings

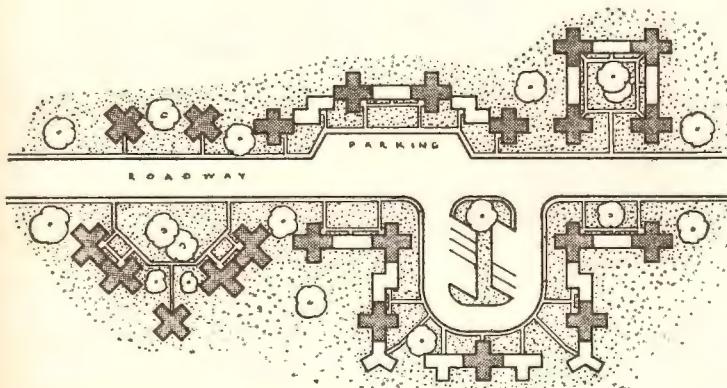
Y Plan Type



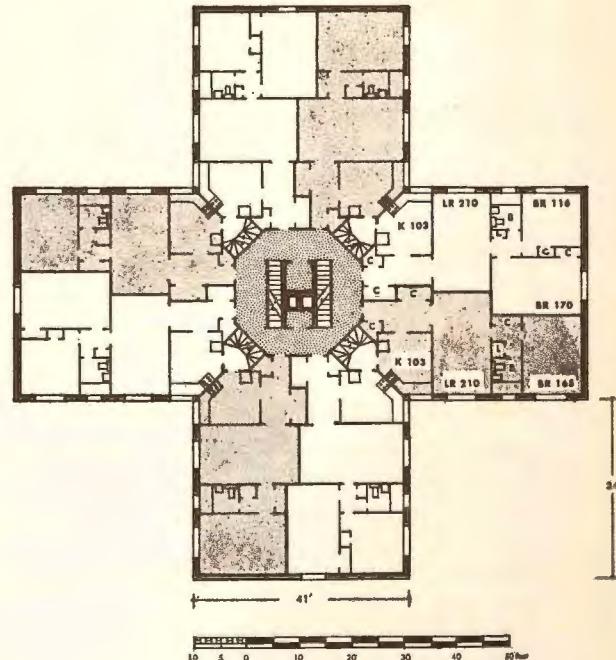
Some Grouping Variations Using Y Plan Type Buildings



Cross Plan Type



Some Grouping Variations Using Cross Plan Type Buildings



The prototype plans illustrated above are limited to simple "walk-up" varieties, three floors in height. Higher buildings require elevator service and, to justify the cost of this installation, more units must usually be provided at each floor level. The plans of such buildings are more complex but also fall into the basic classification of "strip", L, T, Z or X forms.

The greater the number of units there are to each floor the less possible it is to provide cross-ventilation for each unit. Also the area of internal corridor space must be increased proportionately and there is generally a decline in the privacy of each dwelling.

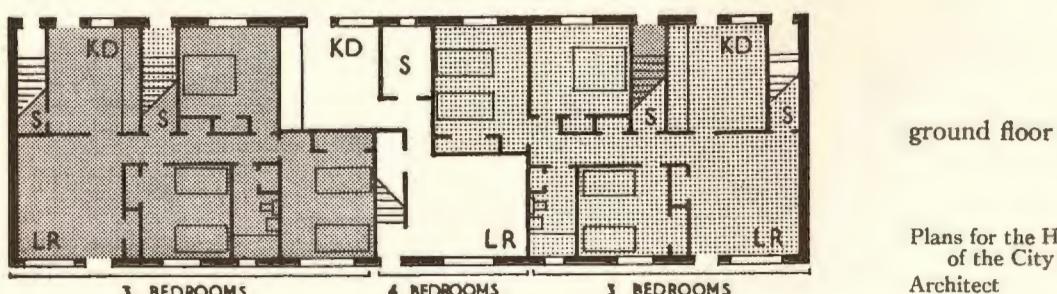
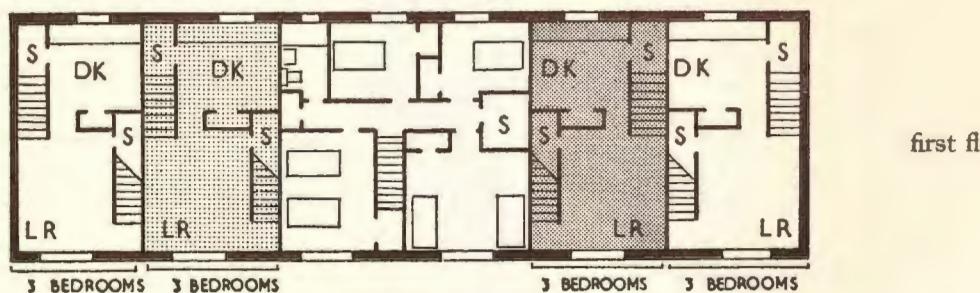
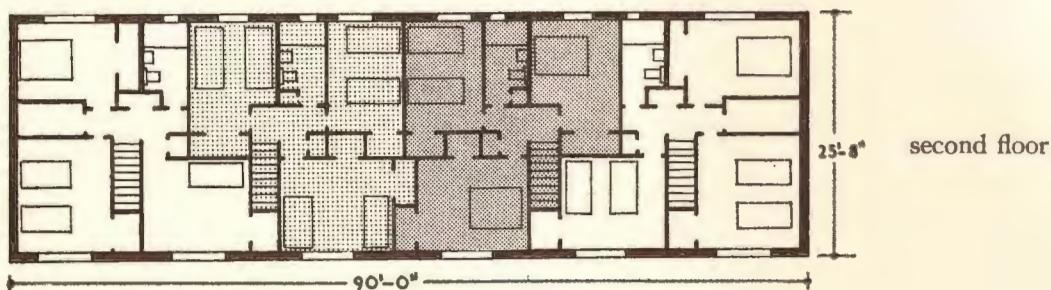
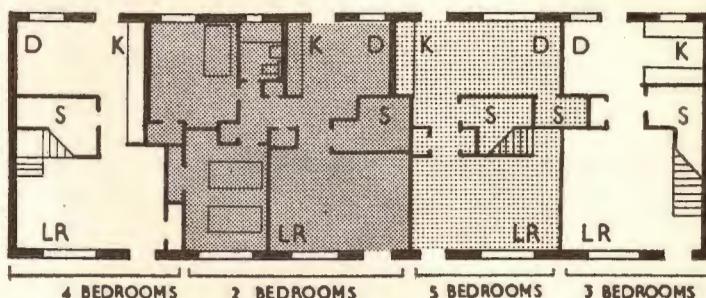
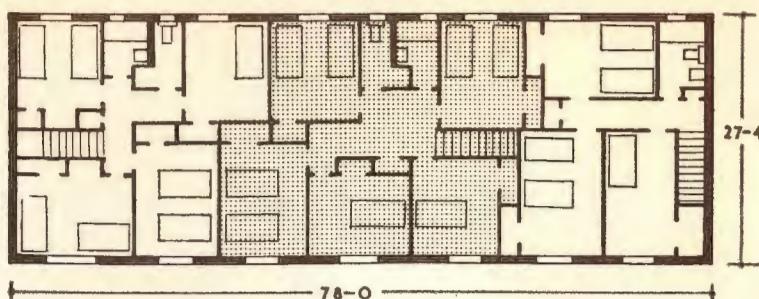
In projects of three-storey buildings the maximum

desirable density is 50 dwellings to the acre and a land coverage of 30 per cent. A reasonable standard of density is between 15 and 30 dwellings per acre and a land coverage from 20 to 30 per cent.

High-rise buildings are justified where densities must be increased beyond reasonable limits for three-floor buildings and it is necessary to release a proportionate amount of open space both for recreation and parking purposes. It will then be desirable to reserve upper-floor units for households without children. If this cannot be done it will at least be necessary to provide balconies for families so far removed from ground-level open space.

TWO and THREE FLOOR HYBRIDS

These buildings are a combination of row housing and garden apartments. Great variety in the number of bedrooms is provided by an ingenious interlocking of units. There is also a relation between the size of living space and the number of bedrooms.



Plans for the Housing Authority
of the City of Baltimore.
Architect A. S. Cochran



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